

IRON AGE

The

May 29, 1958

A Chilton Publication

The National Metalworking Weekly



**Planned Maintenance
Can Help You Boost
Profits**

P. 59

**Steel Leaders Report
On Chances for Upturn — P. 45**

**Cold-Working Moves
Into High-Output Uses — P. 85**

Digest of the Week P. 2-3

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Tool Steel Topics



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Typical Analysis

Carbon 0.35	Tungsten 9.35
Chromium 3.25	Vanadium 0.50

57 HW is ideal for a variety of hot-work applications—everything from hot headers to spike cutters, from punch-and-die inserts to nut piercers. Why not let a trial run convince you? Your Bethlehem tool steel distributor is awaiting your call.

BETHLEHEM TOOL STEEL ENGINEER SAYS:



*Take a Good Look
At Your Grinding Marks*

Some people are surprised to learn that grinding marks often play a big part in determining tool life. This is especially true with deep-hardening dies and punches that have a moving contact with metals under high pressures. Although the surface finish of a ground tool may appear smooth, it actually has a saw-tooth contour. Material moving in the same direction as the grinding marks shows less tendency to "pick-up" or adhere, than material which travels across the grinding marks.

This "pick-up" of material is not desirable on such tools as drawing dies. Here it is advantageous to grind in the same direction as the material is to move. On some types of tools this kind of grinding is difficult, but because of the longer tool life obtained, the effort is worthwhile.

Punches which have been ground longitudinally outlast those which have been ground circumferentially, though the latter is by far the most common method. Here, too, longitudinal grinding pays off, even though it may be inconvenient.

It's well to give serious thought to the direction of grinding on tools. It can make a big difference in getting the best possible tool life.

New
Booklet on
Bearcat
Tool Steel



It's just off the press—a completely new two-color booklet on Bearcat tool steel. The booklet is profusely illustrated, and explains fully why Bearcat is such an outstanding grade for a wide variety of shock applications. If you would like to have a copy for reference, write to Publications Dept., Bethlehem Steel Company, Bethlehem, Pa. Ask for Booklet 458.

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The IRON AGE

May 29, 1958—Vol. 181, No. 22

Digest of the Week in

*Starred items are digested at right.

EDITORIAL

While We Are at It, Let's Look at
Ourselves

NEWS OF INDUSTRY

*Special Report: Steel Men Point Up
Bright Spots in Gloomy Market

*Iron Curtain Opens to Steel Men

*How a Supplier Turned Producer

*Automation Lures Foundrymen

*The Heat's On Aluminum Prices

New Platinum Markets

The IRON AGE Salutes

*Reduce Costs and Boost Profits With
Planned Maintenance

Men in Metalworking

NEWS ARTICLES

STEEL MEETING

Not All Gloom — Steel leaders
attending AISI meeting had little to
cheer about, but were not de-
pressed. Most believe market has
hit bottom and is on the way up
again. They expect higher steel
wage costs will bring a price rise in
July. P. 45

ALUMINUM PRICE HIKE?

Producers Ponder It—On Aug.
1, costs in the aluminum industry

FEATURE ARTICLES

*Cold Working Output Speeds Up

*Ductile Stainless Work-Harden

*New Facts on Nitriding

*Shippingport: Era of Atom Nears

Conveyor Bypasses Obstacles

*What Makes a Small Firm Grow?

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*Machine Tool

will rise about 7 pct when wage
increases go into effect. An off-
setting price hike may have to be
passed up. P. 50

RUSSIAN VISIT

On Their Way—A group repre-
senting the U. S. Steel industry,
including The IRON AGE editor
George F. Sullivan, has begun its
tour of Russia's mines, mills, and
research centers. P. 47

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Metalworking



ket Forge Co., a one-time subcontractor, reached the day when it had to branch out. By using sound market judgment, it was able to develop a product line. P. 48

FOREIGN AID

Cause Hurt — Anti-American outbursts have caused many staunch defenders to take a new look at foreign aid programs. P. 67

FEATURE ARTICLES

COLD WORKING

Moves into High Output — Cold forming owes its growth largely to three factors: improved lubricants to reduce friction, increased knowledge of metallurgy, and development of improved die materials and design. There's savings in reduced stock removal and closer control of dimensions. P. 85

DUCTILE STAINLESS

Work Hardens for Strength — A new, nitrogen-containing stainless work hardens, but has better ductility than Type 301. Proposed applications include wing surfaces, honeycomb skins, manifolds, outside walls of thrust chambers, and nacelle areas of aircraft and missiles. P. 88

NITRIDING

New Facts Point up Value — Two widely used low-alloy, high-strength steels, 4140 and 4340, can be satisfactorily nitrided in a single

cycle. A detailed report brings out new information on the relationship between core hardness and nitrided case hardness. P. 90

ATOM-ELECTRIC POWER

Shippingport Forecasts Era — The first full scale plant to generate atomic power exclusively for civilian use was dedicated May 26. It's a pressurized water reactor intended to advance the technology of this type reactor. P. 94

HOW SMALL FIRM GROWS

In a Sliding Market — A small firm, selling cast bronze bearings and bushings, doesn't claim to have all the answers, but it provides some important lessons in small business management. P. 98

MARKETS & PRICES

TOOL BACKLOGS

Hit New Low — For two years, shipments of machine tools have been outpacing new orders. Now backlog have sunk to about two-and-a-half months, lowest since World War II. P. 71

NEXT WEEK

CONVEYOR SALES

Rebound Expected — Despite the current slump conveyor manufacturers believe their market has "built-in" assurance of long-range growth. Next week's report on conveyor making and marketing will show why they are probably right.

SOUND MAINTENANCE: Skilled specialists like E. H. Wilsey (l.) and J. W. Burgess, aid maintenance pre-planning in Small Motor Dept. of General Electric Co. Such programs have helped many firms reduce costs and boost profits substantially. P. 59

FOUNDRYMEN

Lured by Automation — At the 62nd annual Foundry Show in Cleveland, visitors revealed keen interest in automatic equipment. Many foreign firms, aiming for the U. S. market, exhibited for the first time. P. 49

AUTO PRICES

Are They Too High? — An economist looks at the auto market and comes up with an interesting analysis. Lower income, and other factors have more to do with falling sales than prices. P. 62

FARWEST EXPANSION

Still in the Works — Most big companies are going ahead with West Coast expansion plans. But many smaller firms, faced with troubles in other markets, have to bow out. P. 69

STEEL BAROMETER?

Scrap Market Firming — Many observers believe that a rising scrap market forecasts a pickup in the steel business. Midwestern scrap prices have been on the rise in recent weeks. P. 115

SPEED GEAR BROACHING

With New Process — External helical gear teeth are being turned out in one pass and in a matter of seconds. Next week's technical feature will cover this major breakthrough in gear production. Key to the process is broach design.



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HAVE
TIRED
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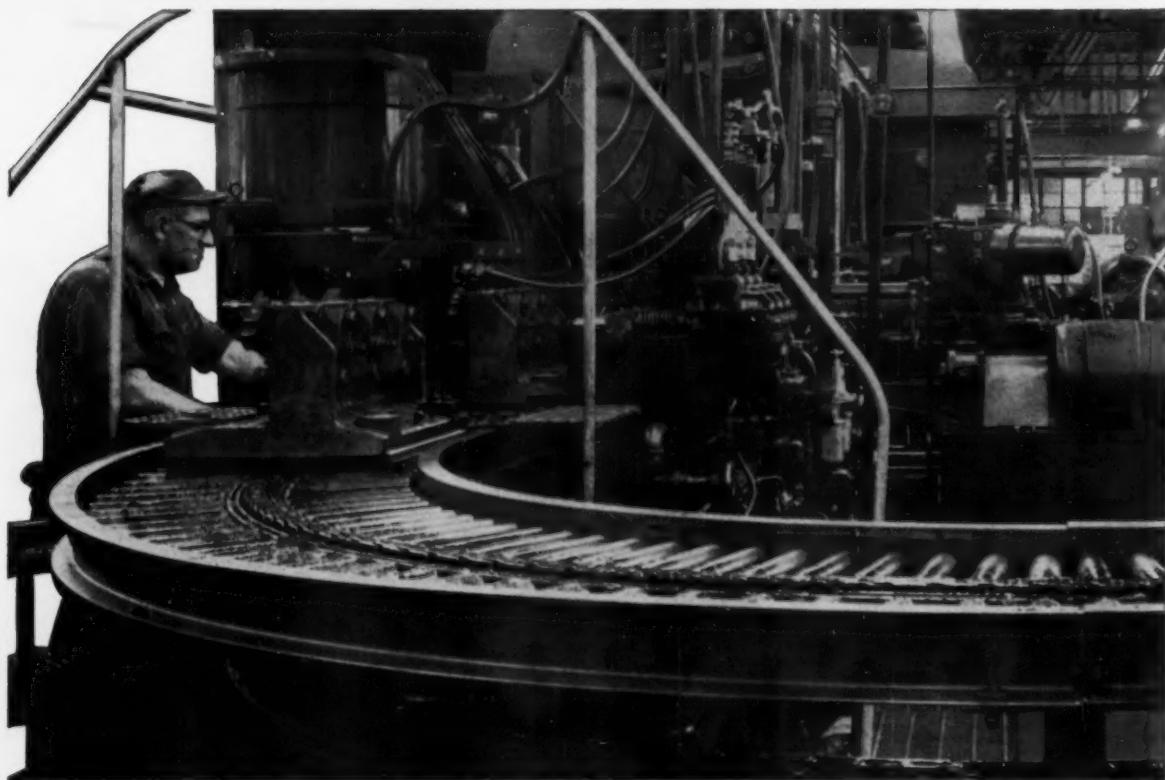
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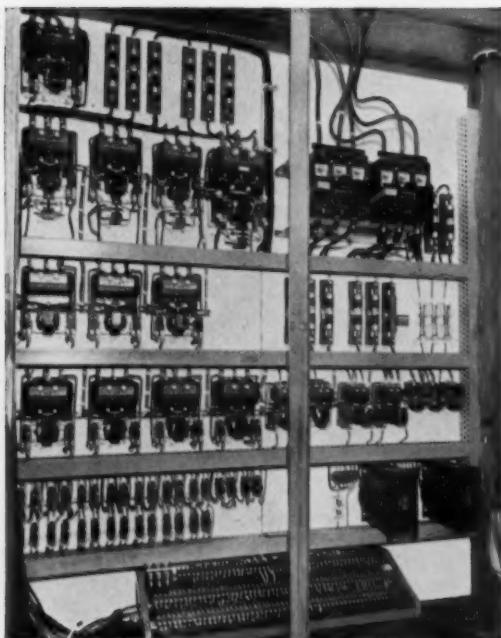
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While We Are at It

Let's Look at Ourselves

Now that there is a great hue and cry about what caused the South American fracases, it may be time to be brutally frank—about ourselves. It's clear the Communists did a well-organized job of giving Dick Nixon the works. It's clear, too, that he was a match for them—as he always has been.

But lest we get too prideful about our South American policies—if we ever had any—we must admit we erred down there. Editorials, stories, and impassioned speeches are common now. But the evidence has been around for years that we were short on brains and experience in our relations with the Latins.

Businessmen have done a better job in South America than our own government. For years we have been paying too much attention to other areas. Our South American trouble was there all the time. We just didn't do anything about it.

In case some of us are taking a too self-righteous view of what the enraged mobs did to Mr. and Mrs. Nixon, let's remember that the attacks were organized by left wingers, but the really backbone people who keep their countries together were deeply embarrassed.

Let's recall, too, that a lot of our South American policies have been made by people who wouldn't know a Latin from a Manhattan: There is a difference. Our astute ambassadors and consuls have tried for years to awaken Washington to South American problems. Now they will get action. For that we can be thankful.

If we get a little gratuitous about protection below the border we may remember with pain that people are continually being knocked off in our country, with quite a few unsolved murders piling up. We have but to listen to Mr. J. Edgar Hoover on the matter of criminal violence and read his "Masters Of Deceit" to find out what is really going on in this country because of hoods and Communists.

We have our own problems of prejudices that are often swept under the carpet while we berate others for the same fault. There are today many cities, streets, and areas where it is no longer safe for free, tax-paying citizens to be about at night.

The point here: While we re-evaluate our South American policies let's do it in a spirit of humility based on the knowledge that we aren't always so right ourselves.

Tom Campbell

Editor-in-Chief

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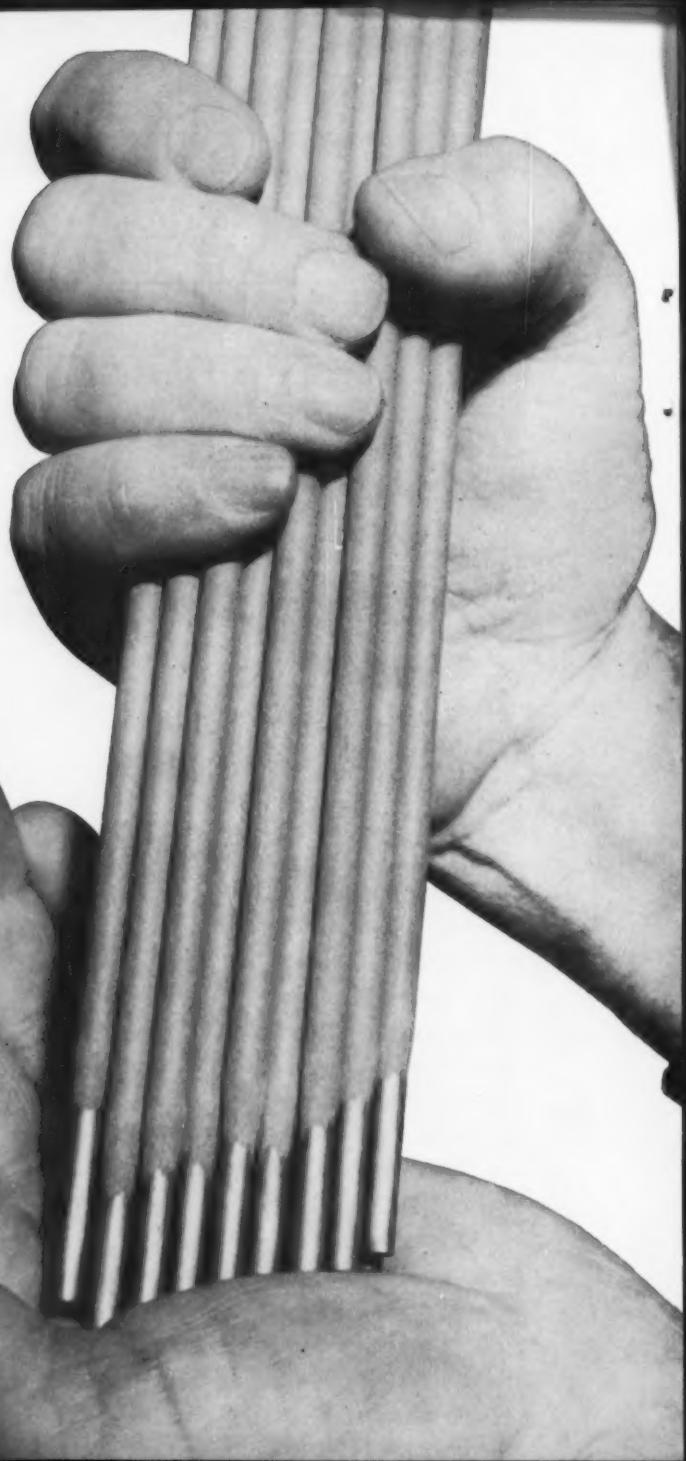
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LETTERS FROM READERS

Welding Shield

Sir—There was mention in the Newsfront section of your May 1 issue on a "vapor-shielded" welding process which uses vapor producing components of the wire electrode as the shielding agent.

We would very much appreciate knowing more about this process. Any information you can make available concerning the process, equipment, and manufacturer of the wire would be very helpful to us.—R. A. O'Donnell, Process Engr., Eljer Co., Pittsburgh.

■ Contact C. G. Herbruck, Asst. to the Secretary, The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland.—Ed.

Motor Control

Sir—In the Apr. 24 issue of The IRON AGE on your Newsfront page there was an item on a new type of AC motor speed control. We are very much interested in such a control. Can you supply us with the control manufacturer's name and address?—H. H. Haworth, Eng. Dept., Belden Mfg. Co., Chicago.

■ Contact F. E. Birtch, Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols, Detroit.—Ed.

Ferrous Castings

Sir—Your Special Report on "How to Get More for Your Ferrous Casting Dollar" (Feb. 13 issue), it one of the best articles that I have ever read regarding the buying and use of castings. I would appreciate it very much if you could send copies to me so that I may route them to people who will be interested in the subject.—R. T. Nelson, Production Mgr., Grinding Machine Div., Norton Co., Worcester, Mass.

Material Costs

Sir—Please send me a reprint copy of your excellent Special Report to Management, entitled "How to Lower Material Costs (May 1 issue), by Charles P. Hawkins. This article contains some very good pointers on a much overlooked area for cost reduction, a matter discussed and studied daily by most manufacturing production personnel.—J. J. Schmidt, Industrial Eng. Dept., Remington Rand Univac Div. of Sperry Rand Corp., St. Paul, Minn.

Correct Weight

Sir—We call your attention to an error on p. 128 of your Apr. 3 issue in article "Rugged Shear Cuts 30 tons of Scrap an Hour."

The Clearing 600 ton scrap cutting shears weigh 335,000 pounds, not 1275 tons.—J. S. Pinkert, Consolidated Mill Supply Co., Chicago.

■ Thanks for bringing this to our attention.—Ed.



"Are you trying to be funny? Of course I can get along with people!"

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THE IRON AGE, May 29, 1958

FATIGUE CRACKS

Boost for Vegas

A few raised eyebrows greeted our last week's report on the American Steel Warehouse convention because it was held in Las Vegas, gambling capital of the world.

After a chat with our man who was on the scene, we'd like to report that Las Vegas is a pretty good place to hold a convention—in case you've been thinking about it. Not because you're likely to get rich at the tables and not because the Nevada oasis boasts such classy entertainment. Here's his report:

"Talked to a chap at the Riviera, which was ASWA convention headquarters. Reports there'll soon be a 120,000-sq-ft convention hall for industrial exhibits. Expected 1500 last year at a mining congress—turnout topped 3000, he said. National Electrical Contractors had a good meeting there too. Many others.

"If you skip the sidebar issues and your food and lodging are good, the test question is 'Do the members attend the meetings and stay awake?'"

"The answer at the ASWA convention was this: Turnout for the 8 am breakfast sessions topped 85 pct of registration. Members were in shape to stay awake—and the program was good enough to keep them awake."

How Was That Again?

Words are tricky. Sometimes they mean a lot more than they say. For these tongue-in-cheek explanations of business terms we're indebted to the Auburn Mfg. Co. of Middletown, Conn.

Policy—We can hide behind this.

A Program—An assignment that can't be completed by a telephone call.

Implement a Program—Hire more people.

Activate—Make more carbon copies and add more names to the memo.

Advise in Due Course—If we figure it out, we'll let you know.

We Will Look Into It—By the time the wheel makes a full turn, we assume you will have forgotten about it.

We Are Making a Survey—We need more time to think of an answer.

Note and Initial—Let's spread the responsibility for this.

Transmitted to You—You take care of it, I'm tired.

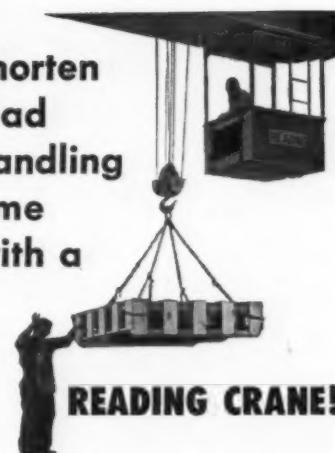
New Puzzler

If you have four figures, each a number 7, how can you arrange them using the plus, minus, divide, and multiplication signs and use each numeral only once to obtain the answer 56? Many thanks to Mr. Ray Patridge, Lebanon Steel Foundry Co., Lebanon, Pa.



"We still have bugs in our conversion from small arms to typewriters."

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COMING EXHIBITS

Materials Handling Show—June 9-12, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Automation Show—June 9-13, Coliseum, New York. (Richard Rimbach Associates, 845 Ridge Ave., Pittsburgh 12.)

Western Packaging & Materials Handling Show—Aug. 11-13, Civic Auditorium, San Francisco. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Chemical Show—Sept. 9-12, International Amphitheater, Chicago. (National Chemical Exposition, 86 E. Randolph St., Chicago 1.)

Packaging & Materials Handling Show—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 S. LaSalle St., Chicago 4.)

Plastics Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

MEETINGS

JUNE

American Gear Manufacturers Assn.—Annual meeting, June 1-4, The Homestead, Hot Springs, Va. Society headquarters, One Thomas Circle, Washington, D. C.

Institute of Appliance Manufacturers—Annual convention and exhibit, June 2-4, Netherland Hilton Hotel, Cincinnati. Society headquarters, Shoreham Hotel, Washington, D. C.

The American Nuclear Society—Annual meeting, June 2-5, Statler Hotel, Los Angeles. Society headquarters, P. O. Box 963, Oak Ridge, Tenn.

Pressed Metal Institute—Management meeting, June 4-5, Hotel Carter, Cleveland. Society headquarters, 3673 Lee Rd., Cleveland.

The Commercial Chemical Development Assn.—Spring meeting. (Continued on P. 16)

PRECISION PRODUCTION PROBLEMS?



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Shutdowns
for lubrication
cut in half
with

RYKON

Grease

Dollars in production
time saved by using
RYKON in high
temperature service at
Northwestern Steel
& Wire Company



Bearings on the 46-inch blooming mill manipulator and side guard carrier had to be lubricated twice each eight-hour shift before RYKON Grease was used. The mill had to be shut down while the lubrication work was performed. Now with RYKON, the bearings are greased once each shift. Maintenance men find rollers and pins are still well lubricated. The rollers are subject to almost constant heat and water washing. Steel blooms heated to approximately 2300° F. are just 18 inches away from the RYKON lubricated bearings. The lubricating properties of the grease are unaffected by the heat.

RYKON Grease delivers similar performance results elsewhere in the plant. In roller bearings on the reheating furnace charging tables, in pinch roll bearings and in other trouble spots, where heat and continuous water washing would make short work of other greases, RYKON stands up to the test.

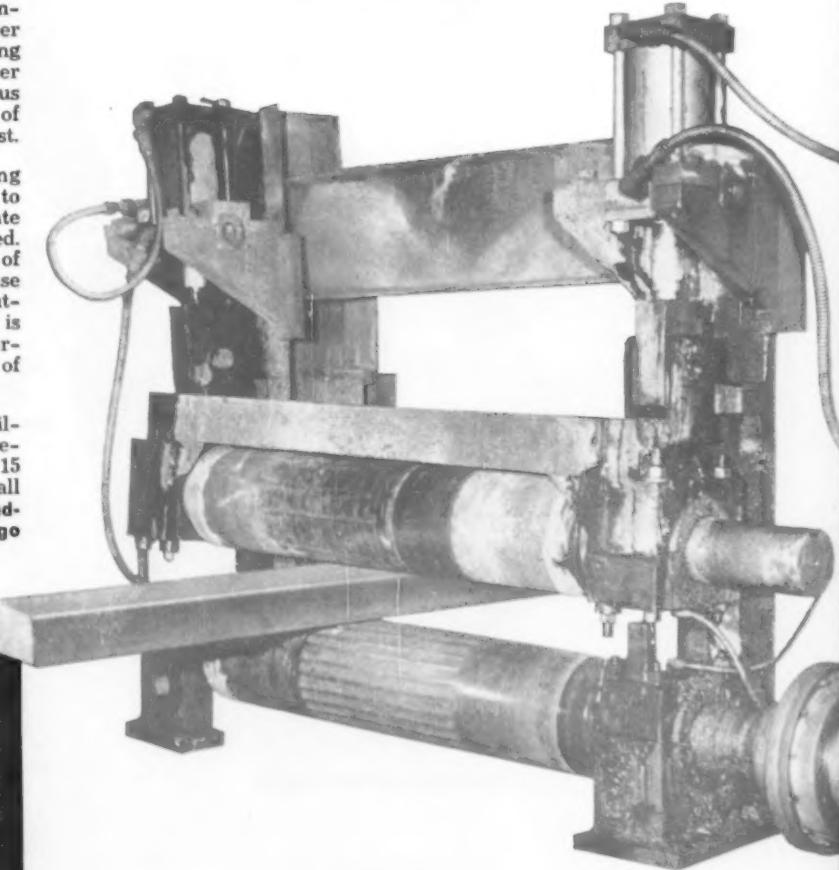
A unique nonsoap, organic thickening agent gives RYKON Grease the ability to provide lubrication in tough-to-lubricate spots long after other greases have failed. This thickener is the result of five years of research effort by a Standard Oil grease research team working to develop an outstanding industrial grease. RYKON Grease is a true multipurpose grease capable of performing all lubrication jobs on one piece of equipment or often in an entire plant.

More facts about RYKON Grease are available from the Standard Oil lubrication specialist that is near you in any of the 15 Midwest and Rocky Mountain states. Call him. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about RYKON Grease

- Stable at high temperatures. At sustained high temperatures RYKON Grease remains soft and grease-like.
- Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation. Thickener acts as an inhibitor.
- Exceptional rust preventive properties.

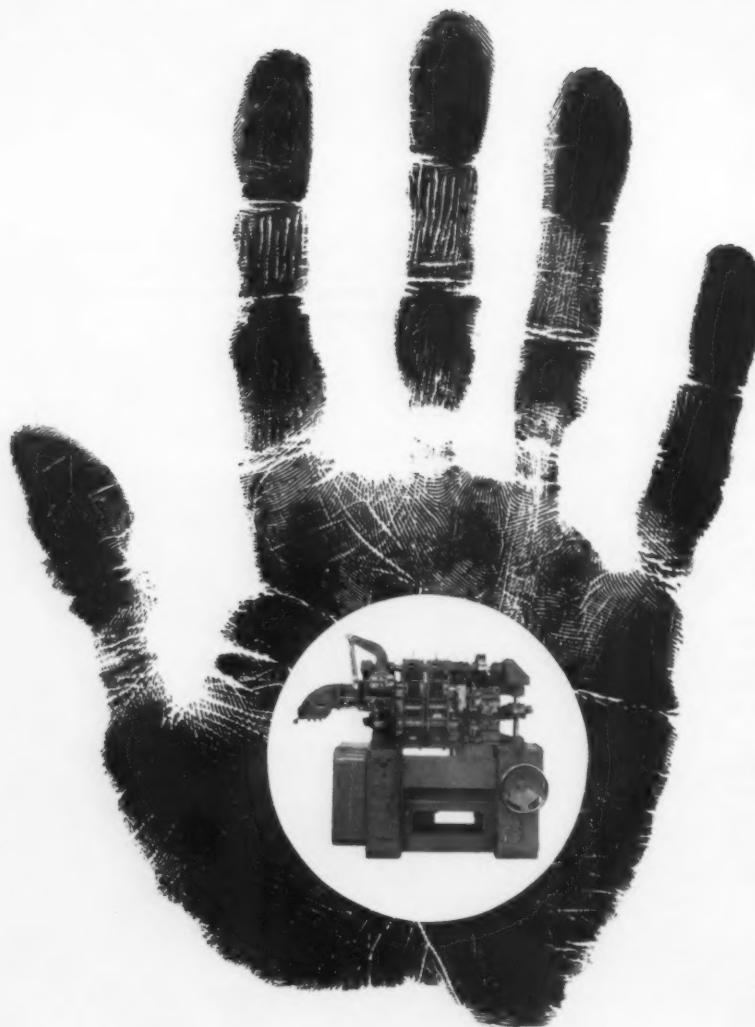
Bloom in the pinch roll. A 2300° F. bloom goes through while water washes continuously. RYKON Grease keeps this equipment lubricated at all times in spite of heat.



You expect more from **STANDARD** and get it!



Lubrication time cut. Mill feeder pinch roll bearings formerly lubricated twice each eight hours. Now with RYKON Grease lubrication is needed only once each shift. Elbert Dean, Northwestern Steel lubrication engineer, and Standard Oil lubrication specialist, Charles Daub, inspect bearings. Counseling people who have lubrication jobs like this is work for which Chuck Daub is well-qualified. Chuck has 12 years' experience in lubrication technical service work. He has an engineering degree from Illinois Institute of Technology and has completed the fifteen week Standard Oil Sales Engineering School course.



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EXHIBITS, MEETINGS

(Continued from P. 13)

June 5-6, Hotel Niagara, Niagara Falls, N. Y. Society headquarters, 60 E. 42nd St., New York 17.

American Boiler Mfrs. Assn. and Affiliated Industries—Annual meeting, June 8-11, Skytop Lodge, Skytop, Pa. Society headquarters, 4062 Mayfield Rd., Cleveland.

Malleable Founders' Society—Annual meeting, June 9-10. The Homestead, Hot Springs, Va. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

The American Society of Mechanical Engineers—Semi-annual meeting June 15-19, The Statler Hilton Hotel, Detroit. Society headquarters, 29 W. 39th St., New York.

American Foundrymen's Society—Annual foundry instructors seminar, June 19-21, Castle Institute of Technology, Cleveland. Society headquarters, Golf & Wolf Rds., Des Plaines, Ia.

Alloy Casting Institute—Annual meeting, June 21-24, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

American Society for Testing Materials—Annual meeting and exhibit of scientific apparatus and laboratory supplies, June 22-27, Hotel Statler, Boston. Society headquarters, 1916 Race St., Philadelphia.

Investment Casting Institute—Spring meeting, June 23-25, Occidental Hotel, Muskegon, Mich. Society headquarters, 27 E. Monroe St., Chicago 3.

Industrial Safety Equipment Assn., Inc.—Annual meeting, June 24-27, Oyster Harbors, Osterville, Mass. Society headquarters, 420 Lexington Ave., New York.

Drop Forging Assn.—Annual meeting, June 25-28, The Homestead, Hot Springs, Va. Information: D. M. Allgood, exec. vice president, Drop Forging Assn., Cleveland 13.

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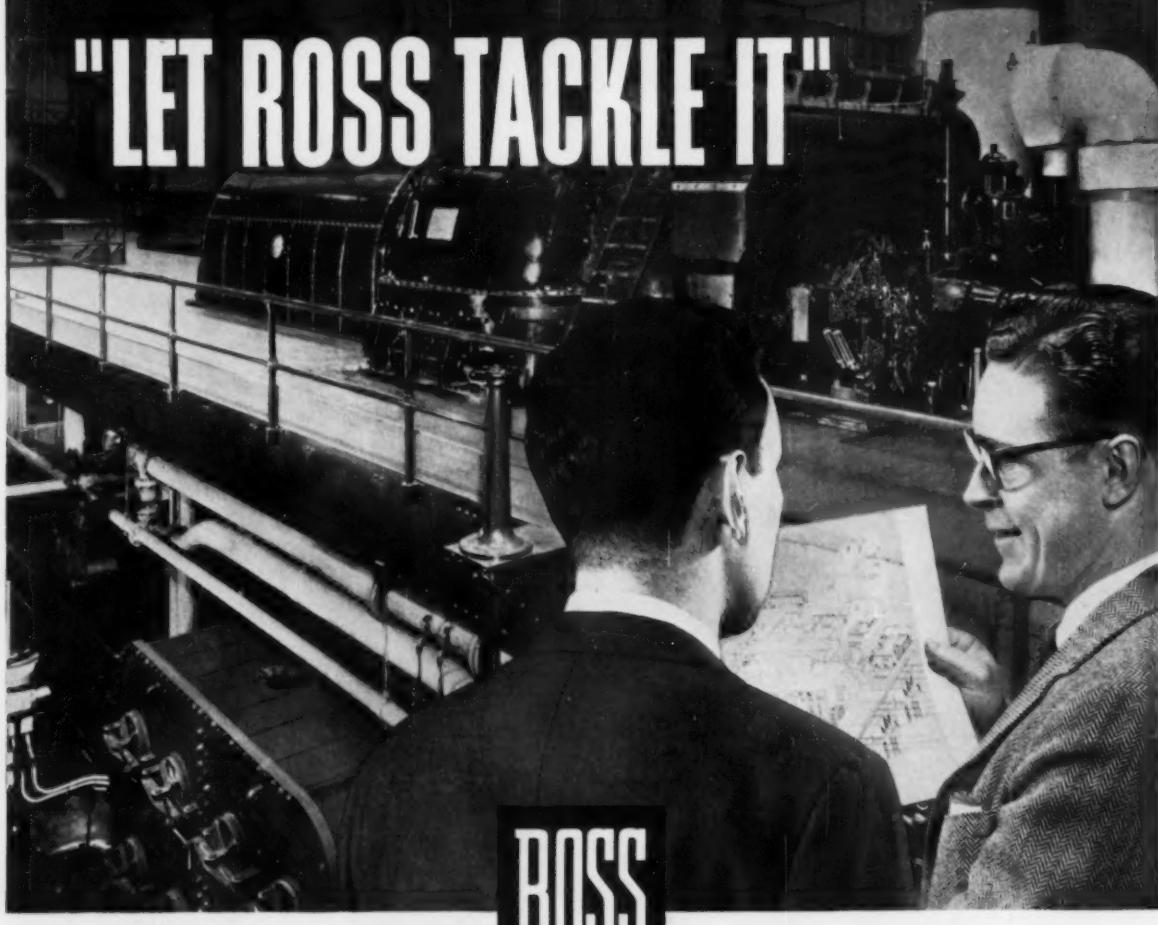
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Republic Steel Lockers help employees start their day and end their day with a good feeling about the company. These high quality lockers just plain look better! They resist surface damage and unsightly rust because they're Bonderized, then finished with long-lasting baked enamel. Incidentally, modern locker rooms needn't be drab. Republic offers a choice of lighter, brighter locker colors.

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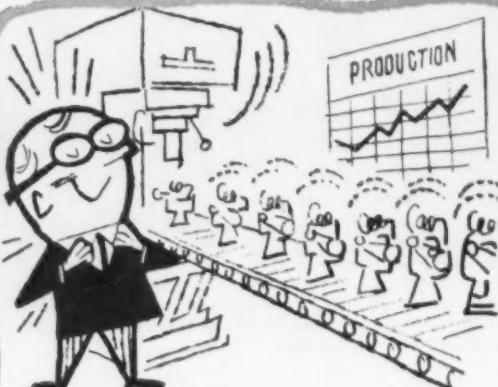
1. GOT A PROBLEM? Which pressing job has you stumped—how to make it . . . how to do it faster . . . how to turn it out for less? Bring in your job . . . talk it over with a trained Denison Multipress Specialist. Getting our heads together *now* starts us on the track to the answer.



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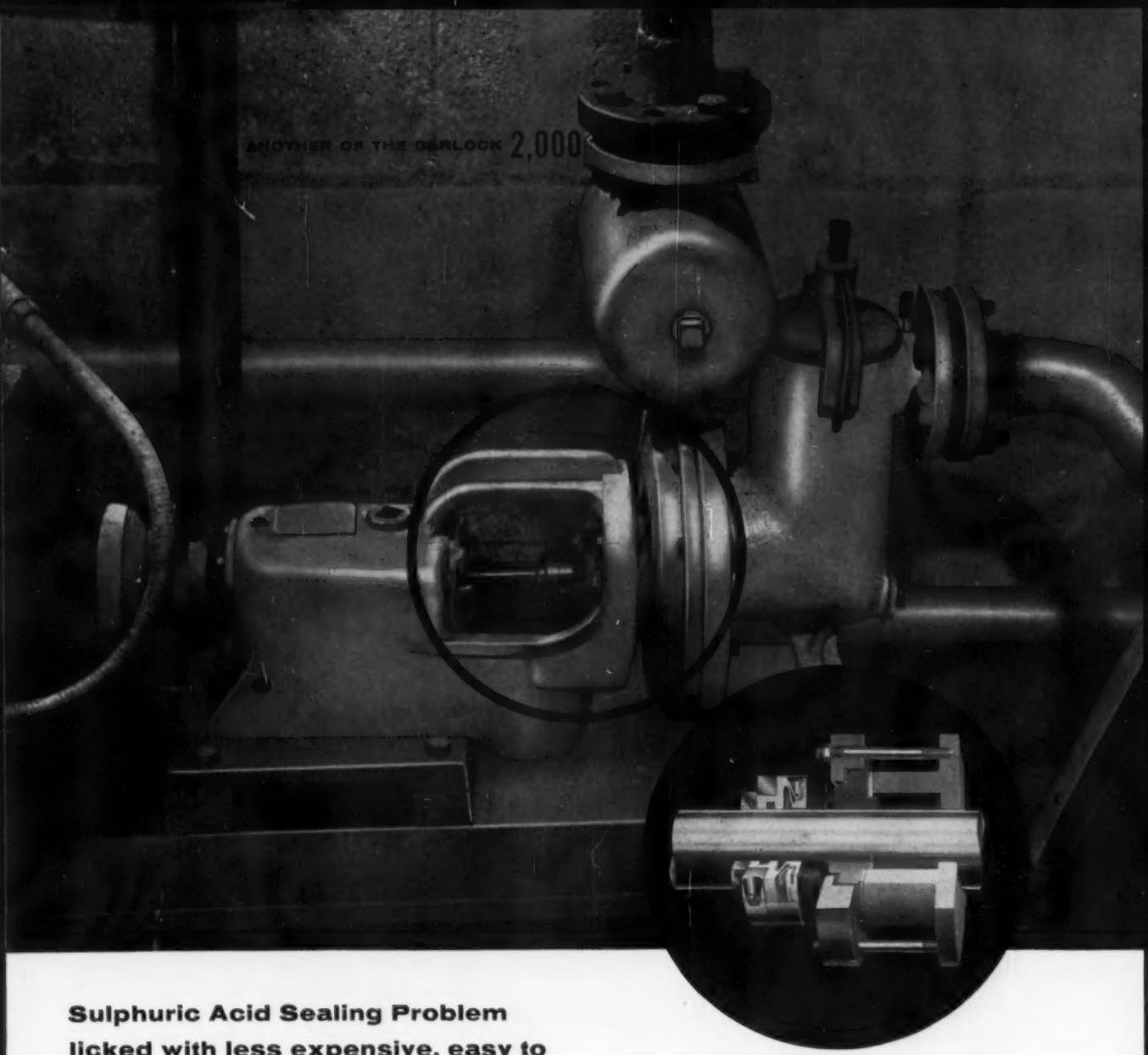
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Solved with less expensive, easy to
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Garlock CHEMISEAL Mechanical Seal used on pumps at
Continental Oil Co. has TEFLOTM bellows, a TEFLOTM-filled
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cal Seals. They handle up to 100,000 lbs. per day of sulfuric acid at temperatures to 135° F.

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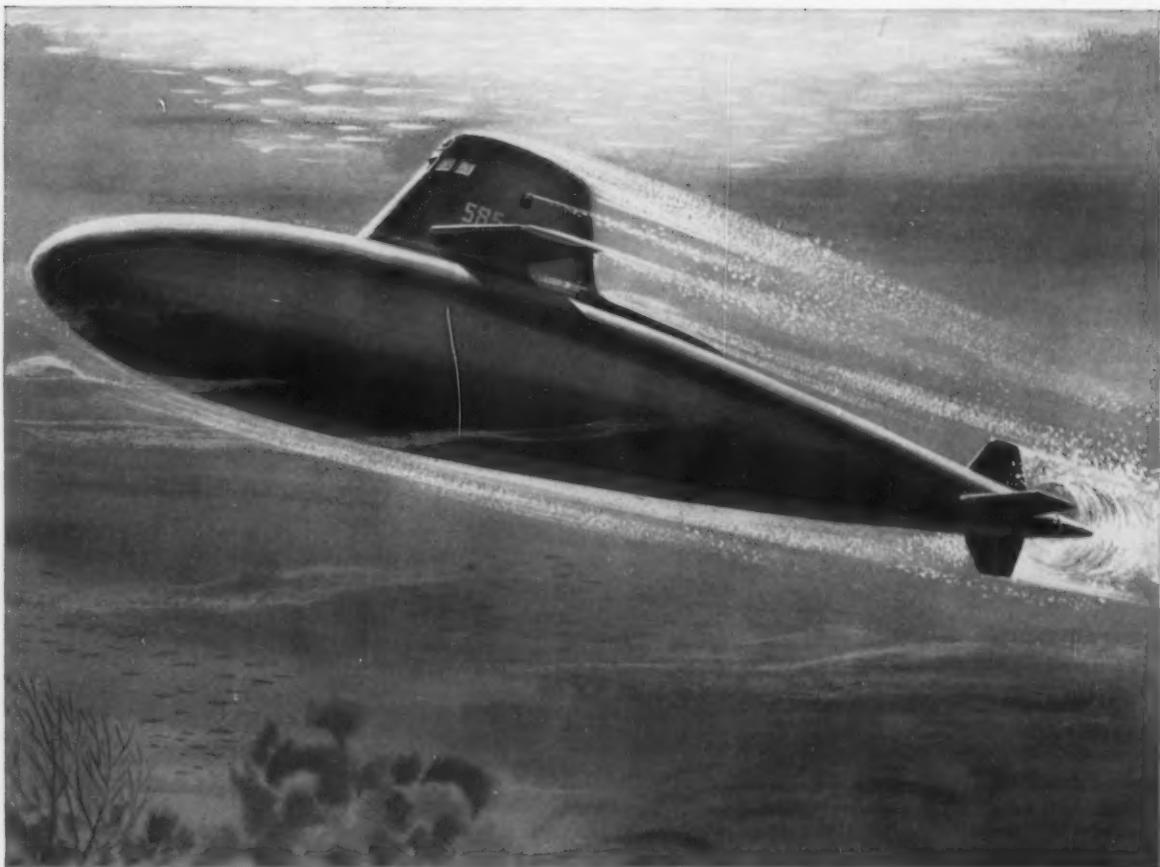
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Sandusky cylinders help the Skipjack CRUISE, DIVE, STEER, BREATHE and FIGHT!

Centrifugally cast cylinders by Sandusky play vital roles in the U. S. Navy's newest atomic-powered submarine, No. 585 *Skipjack*, as components of the nuclear propulsion system, the steering and diving systems, the torpedo firing mechanism, and radar and induction mast assemblies.

The *Skipjack* is the prototype of a new series of seven submarines all with blimp-shaped hulls for greater underwater speed. Her design and materials specifications were laid down by the U. S. Navy and her builder, The Electric Boat Division of General Dynamics Corporation, who chose Sandusky Centrifugal Castings to do more than ten jobs in structural, mechanical, pneumatic, and hydraulic applications.

All of these components—centrifugally cast of heat and corrosion-resistant stainless steels, high-

strength carbon steels, Monels, and bronzes—provided the *Skipjack*'s designers with the required mechanical and physical properties at the lowest cost.

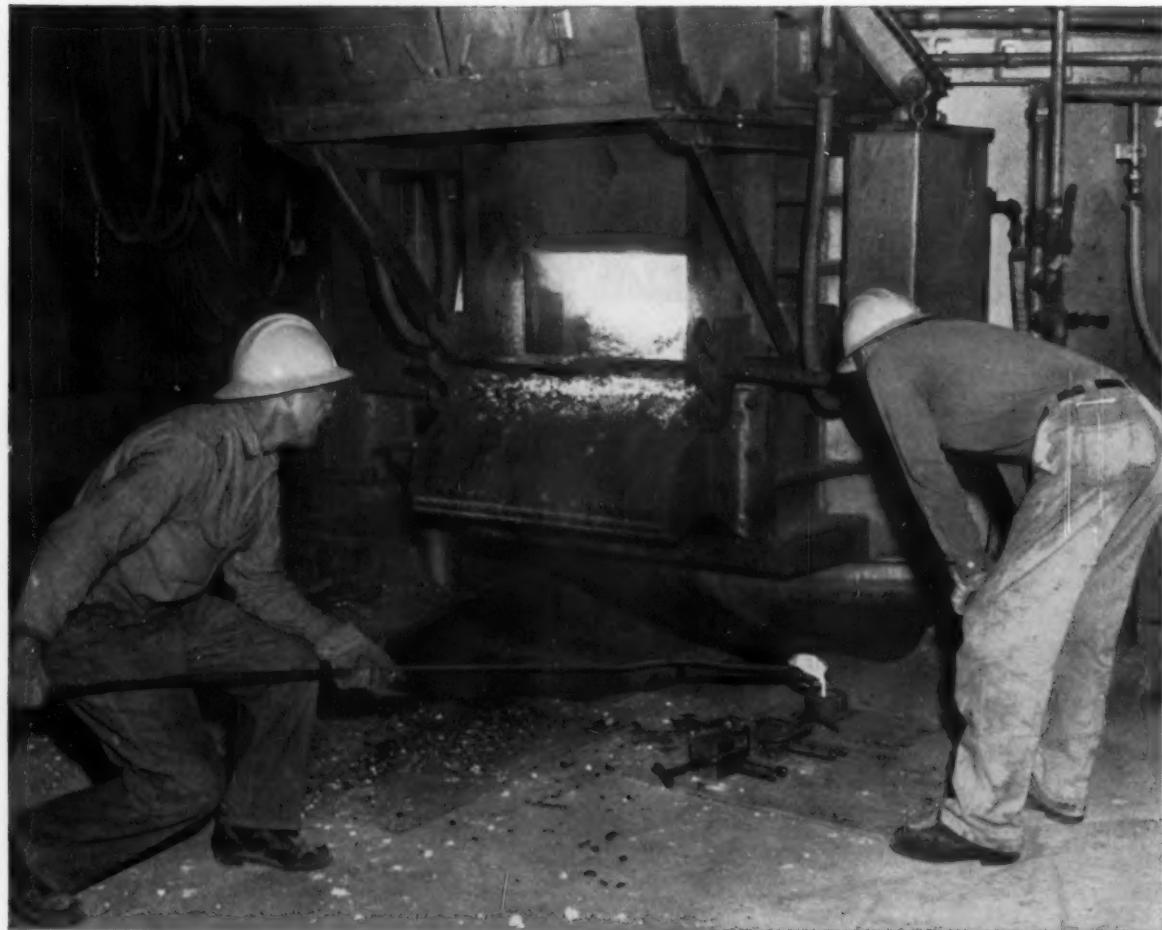
You, too, may find a ready solution to your cylindrical problems in Sandusky Centrifugal Castings. We invite your inquiries.

Sandusky cylinders are cast and machined in this range:

- From 7" to 54" O.D.
- Up to 33 ft. in length (depending on diameter)
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We invite you to discuss your next casting needs with us. You will appreciate our personal interest in your problems—and our economical methods of solving them. Write Dept. 1-E.

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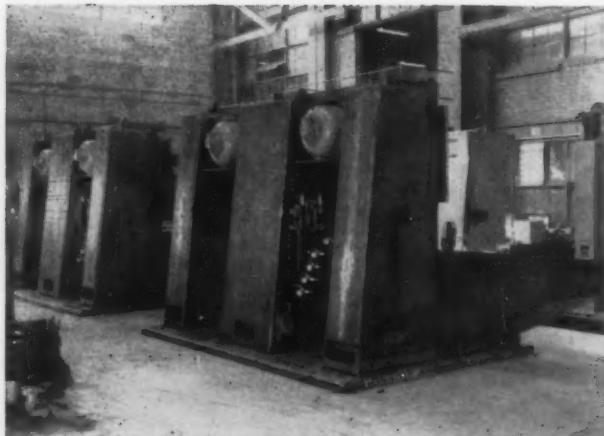


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engineered and built in
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with Weldynamics**



*Belt grinder for automotive industry designed and fabricated by
The Curtis Machine Corporation, Jamestown, New York.*

Weldynamics made possible savings of \$4800 and permitted fabrication of this machine in just four months.

The savings are possible because steel is 3 times stronger and 2½ times as rigid as iron. Thus less material is needed. Pattern expense is eliminated.

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Lincoln men, trained in Weldynamics, will help you design your product for lower costs. They will advise and recommend proper procedures, equipment and electrodes to save time and expense in fabrication.

New, 11th edition, "Procedure Handbook of Arc Welding Design and Practice" has 1300 pages, 1100 illustrations, 240 pages on machine design. \$3.00 in U.S.A., \$3.50 elsewhere.

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THE IRON AGE, May 29, 1958

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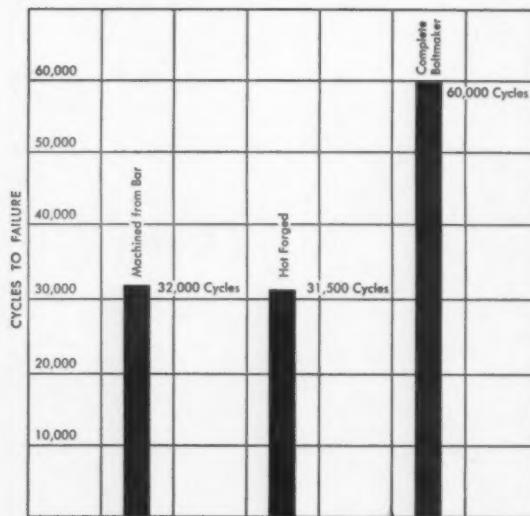
Cleveland cold forged large diameter hex cap screws and bolts have 12.5% more tensile strength, double fatigue durability

Recent tests of large diameter hexagon head cap screws and bolts made on Cleveland's giant 1 1/4-in. Boltmaker definitely proved their superiority. In the tests, the screws were compared for static and dynamic properties with similar products made completely by machining from bar stock and with others made by hot forging heads and cutting threads. All test specimens were made of 1018 low carbon steel. Test results are shown below.

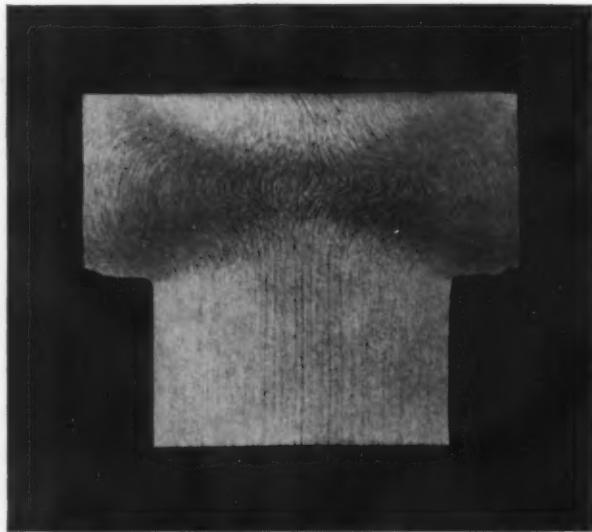
Cleveland now offers immediate delivery on a wider range of these stronger cold forged products than any other manufacturer. Large diameter hexagon head cap screws and bolts, 7/8, 1, 1 1/8 and 1 1/4 in., up to and including 10 in. (maximum) in length, are now completely cold forged automatically on the new Boltmaker. Write today for detailed test report, samples and prices.

STATIC TENSILE AND YIELD PROPERTIES

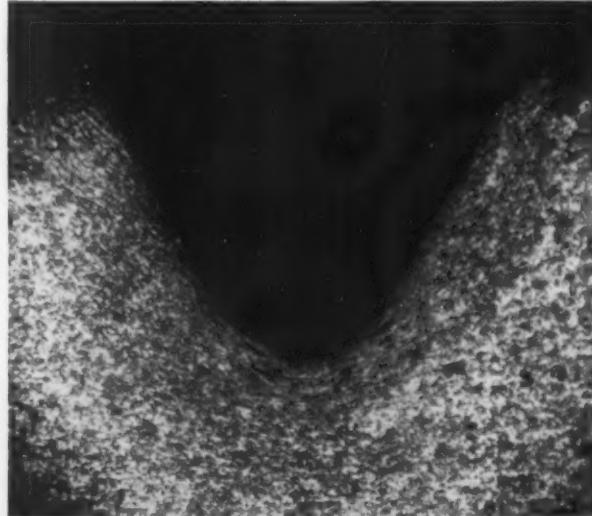
Nature of Test	Complete on Boltmaker	Hot Forged	Machined from Bar
Ultimate tensile (lb.)	90,000	74,000	77,500
psi (tensile stress area)	92,900	76,400	80,000
Yield strength (lb.)	77,000	55,800	69,500
psi (tensile stress area)	79,500	56,700	71,700
Single shear (lb.)	65,000	57,000	61,000
psi	53,568	46,975	50,270



Dynamic fatigue properties. Maximum alternating load induced in specimens was 53,262 lb., minimum 5325 lb. Stress computed at 50,000 psi on tensile stress area, speed 1200 cpm.



Enlarged cross section of cap screw cold forged on the 1 1/4-in. Boltmaker. Symmetrical, unbroken grain flow in shank-to-head area assures maximum strength.



Microphotograph of rolled thread section, showing how the grain flow follows the root radii and thread flanks. Structure increases the fatigue and tensile strength in this critical area.



THE CLEVELAND CAP SCREW COMPANY 4444-1 Lee Road, Cleveland 28, Ohio

WAREHOUSES: Chicago • Philadelphia • New York • Los Angeles • San Francisco



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Service is a word that gets kicked around a lot—often tossed off lightly and loosely. But here at Ingersoll Steel, *service* is a word we live by.

It means, for example, tailoring our production schedules to *your* requirements. It means producing to your exact analysis, size and thickness specifications. It means quality control to assure uniformly high quality from one order to the next, so you can depend on the fabricating characteristics you expect. It means deliveries timed to your production needs. It means providing technical information whenever required.

So next time you need stainless sheets or plates—solid, heat-resisting, or clad—call Ingersoll Steel and get a new slant on *service*.

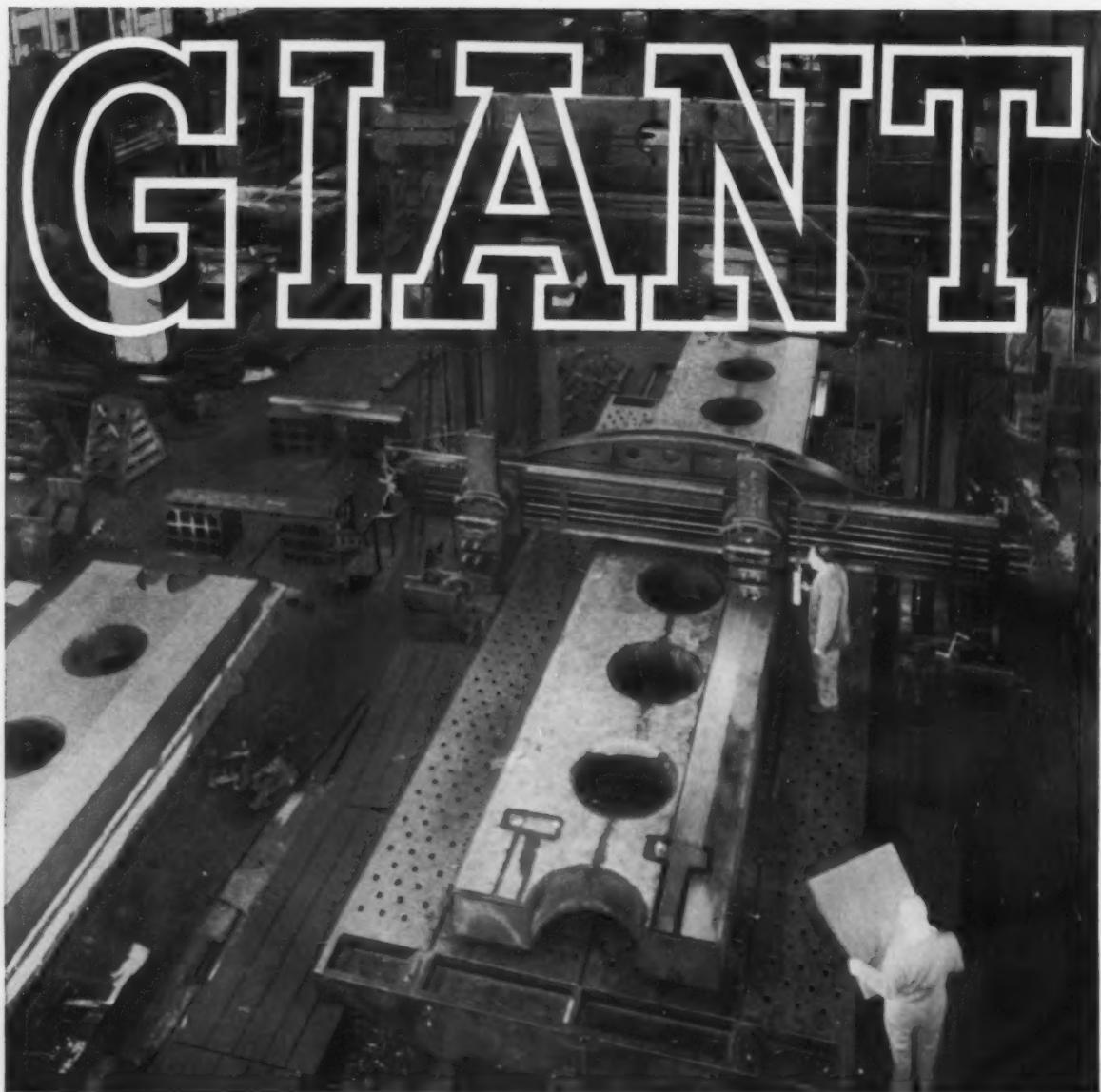
Our telephone number is New Castle (Indiana) 132



Ingersoll STEEL DIVISION

Borg-Warner Corporation

New Castle, Indiana



IN THE MAKING

Machining a section of a 7500-ton press. This weldment weighs 83 tons. It is shown on a 14' x 30' planer.

The machining of this huge weldment or the building of a complete machine, large or small, is a type of work regularly performed in Sun Ship's machinery plant, where *Marine and Industrial* machinery is built.

We invite discussion of your machinery problems.

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MOLY NEWS

CLIMAX MOLYBDENUM CO. DIVISION • AMERICAN METAL CLIMAX, INC.



Climax Develops an Extremely Tough, Abrasion-resistant Chrome-Moly White Iron

New Alloy Proves Superior in Erosive Applications

A new martensitic white iron has proved exceptionally tough and resistant to abrasion. It's called Alloy 42. Its excellent combination of properties are related to its structure — which consists of hard chrome-moly carbides favorably distributed in a matrix of martensite plus retained austenite.

Tests indicate Alloy 42 is especially economical for parts subject to erosive wear: sand pumps, flotation impellers, sand classifier wear shoes, pug mill blades, brick mold liners and chute liners.

For example, heat-treated Alloy 42 impellers in a 5" sand pump handling coarsely ground taconite ore have already lasted over 1,000 hours. Previous impellers made of a 4.5% Ni, 1.5%

Cr type of martensitic iron lasted only 350 to 400 hours.

Because of its toughness, Alloy 42 can also be used where moderate impacts would cause low alloy types of white iron to break or spall. And it may prove more economical than the soft rubber parts or linings now used in various abrasive applications. Its resistance to tearing by tramp coarse materials and chemical attacks by oils and other organic compounds is an obvious advantage.

The recommended composition range is: Carbon 3.00-3.50%; Silicon 0.30-0.60%; Manganese 0.60-0.90%; Chromium 15.0-18.0%; Molybdenum 2.75-3.25.

A Climax bulletin on Alloy 42 discusses melting and casting, molds and shrinkage, heat treatment, structure, physical properties, machinability, welding and cutting. For a free copy, circle #1 on the coupon.

Heat Treating Improves the Wear Resistance of Gray Iron

Heat treating can improve many of the properties of gray iron, particularly resistance to wear. Wear resistance in quenched-and-tempered gray iron is many times greater than that of pearlitic irons. With cams and similar parts, hot quenching provides better wear resistance than quenching and hardening to the same hardness. Surface hardening is frequently selected for gray iron because it locally improves wear resistance with minimum distortion.

Why Moly Iron Bulletin #6 contains valuable information on surface hardening, annealing and stress-relieving molybdenum-alloyed irons. This bulletin gives examples of improvements obtained by heat treating gears, cable drums, pump-ring castings, tappets, valve guides and machine tool ways.



Flame hardening the teeth on a sprocket improves wear resistance with minimum distortion.

For a free copy of "Why Moly Iron Bulletin #6," circle #2 on the coupon.

Tempering Low-Alloy Creep-Resistant Steels

A recent British paper discusses the roles of chromium, molybdenum and vanadium in low-alloy steels with high creep strength. The relation between creep properties, microstructure changes and carbide composition is given special attention.

For a copy of "The Tempering of Low-alloy Creep-resistant Steels Containing Chromium, Molybdenum and Vanadium" by E. Smith and J. Nutting, circle #6.

Moly Helps High Alloys Fight Corrosive Attacks

Highly alloyed materials are playing a greater part in combating corrosion. A current paper on these alloys con-

siders the molybdenum-bearing alloys at length and also discusses cobalt-base alloys and silicon-bearing alloys.

For copies of this paper, "High Alloys to Combat Corrosion" by E. D. Weisert, circle #7.

Thermenol Shows Excellent Resistance to Heat, Corrosion

Thermenol, an iron-aluminum-molybdenum magnetic alloy, compares favorably with other high-temperature materials, and in some cases promises even better service. For unlike many alloys, it doesn't lose tensile strength rapidly up to 1200 F. It also has excellent resistance to oxidizing and sulfur-bearing atmospheres at high temperatures.

For a copy of "Iron-aluminum Magnetic Alloy Has Excellent Heat Resistance," circle #8.

Moly in Nickel-base Casting Alloys Improves High Temperature Service

Molybdenum is helping at least two nickel-base alloys to work more effectively in high temperature applications. One of the alloys, with 5% Mo, combines good castability with very good creep strength at temperatures up to 1800 F (much better than that of moly-free alloys). The second, with 10% Mo, shows high resistance to thermal shock.

For free copies of "Some Properties of Nickel-base Casting Alloys for High-temperature Service" by D. R. Wood and J. F. Gregg, circle #3.

Cast Steels Studied at Low Temperatures

The British Steel Castings Research Association has completed new studies on the effect of melting practice, composition and treatment of steel castings. Five of the seven alloy steels investigated contained molybdenum. The benefits of using molybdenum in low alloy steel castings for low temperature service are clearly shown in comparisons of 1.5% Mn and 1.5% Mn-Mo.

For reprints of "The Low-temperature Impact Properties of Cast Steel" by W. J. Jackson and G. M. Michie, circle #4.

New Data Available on Low Carbon Bainitic Steels

Studies have been made on new steels based on boron-0.5% Mo. Tensile strengths up to 180,000 psi can now be obtained within the bainitic range with a wide range of cooling rates. Thus these low-carbon bainitic steels offer a good combination of mechanical properties as rolled or as-air-cooled. These properties can be obtained in large sections because hardenability is high. Good welding properties and tempering characteristics make the steels especially suitable as high-strength weldable steels, forgings, die blocks, etc.

For copies of "Low-carbon Bainitic Steels" by K. J. Irvine and F. B. Pickering, circle #5.

CLIMAX MOLYBDENUM CO. DIVISION, DEPT. 2
AMERICAN METAL CLIMAX, INC.
500 FIFTH AVENUE, NEW YORK 36, N. Y.

I'd like more information on:

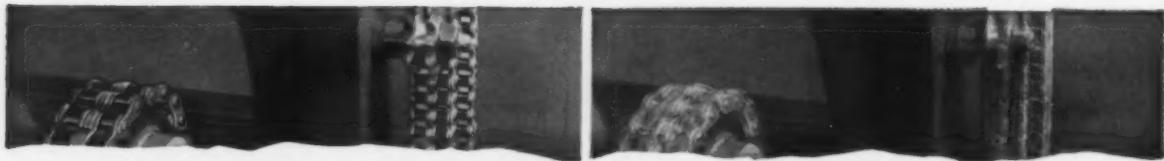
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Name _____

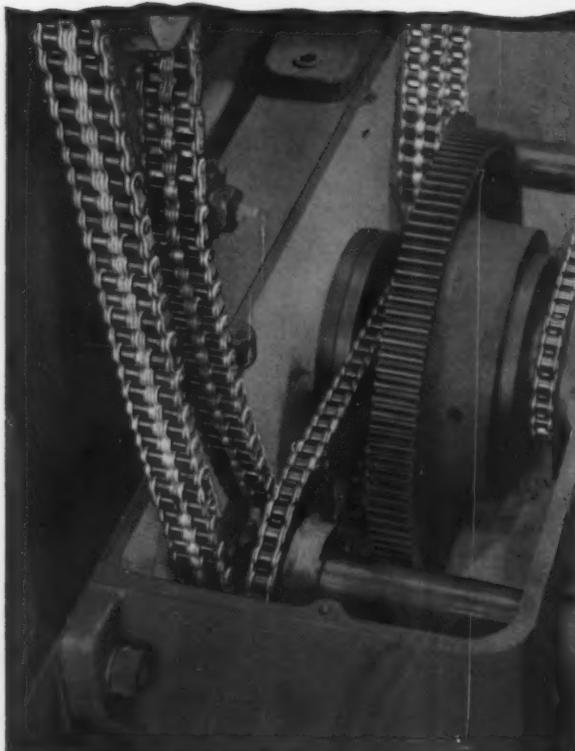
Company _____

Street _____

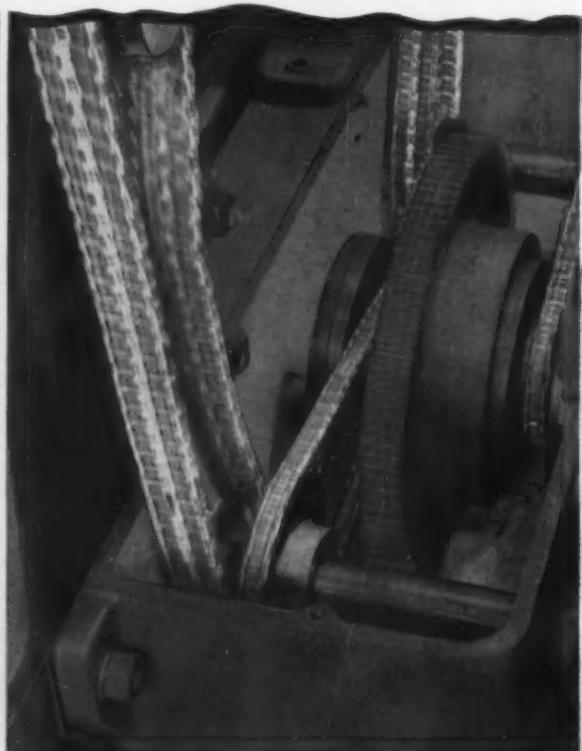
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To static strength . . . add *dynamic strength*



RESISTANCE TO TENSILE STRESS is achieved with properly heat-treated, accurately machined side bars made of premium steel and fitted with properly hardened pins, bushings, rollers.



STRENGTH OF CHAIN IN MOTION results from such refinements as pitch-hole preparation, micro-finish of parts, special processing of side bars, pre-lubrication, rigid quality control.

Why LINK-BELT roller chain takes stresses in stride

ON tough-service drives and conveyors, Link-Belt precision steel roller chain consistently delivers longer life. That's because its *greater dynamic strength* withstands the starting shock and centrifugal loads of severe operation.

Reports from users prove the effectiveness of Link-Belt's manufacturing extras that add to greater dy-

namic strength. Shot-peened rollers give greater fatigue life and ability to withstand impact . . . lock-type bushings end a common cause of chain stiffness . . . pre-stressing provides uniform load distribution . . . closer heat-treat control insures uniformity.

For facts, see your nearby Link-Belt office or authorized stock-carrying distributor.

16,613

LINK-BELT

ROLLER CHAIN AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N. S. W.; South Africa, Springs. Representatives Throughout the World.



WORLD'S LARGEST

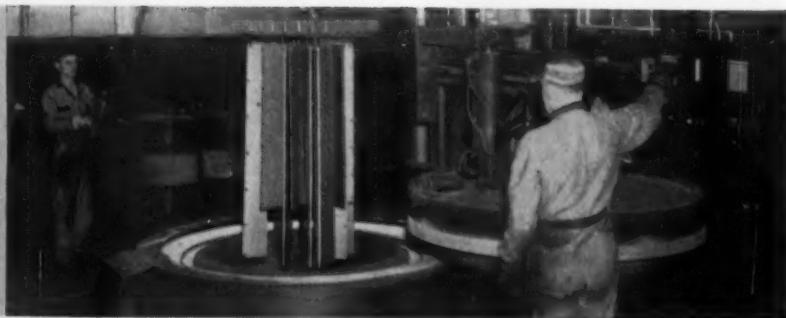
Gas-Fired Homocarb® Furnace Installed

"This equipment took a sizable bite out of our limited expansion capital," says Carl H. Muehlemeyer, President of O. T. Muehlemeyer Heat Treating Company, commercial heat treaters in Rockford, Ill., "but we chose it deliberately after much consideration because we know that with it, we can give our customers the quality and service they require at a competitive cost."

Muehlemeyer points out that, "This furnace is part of a quality-control expansion program extending over the next several years. It reached us from Leeds & Northrup ready for installation with complete instrumentation for Speedomax temperature control and Microcarb atmosphere control."

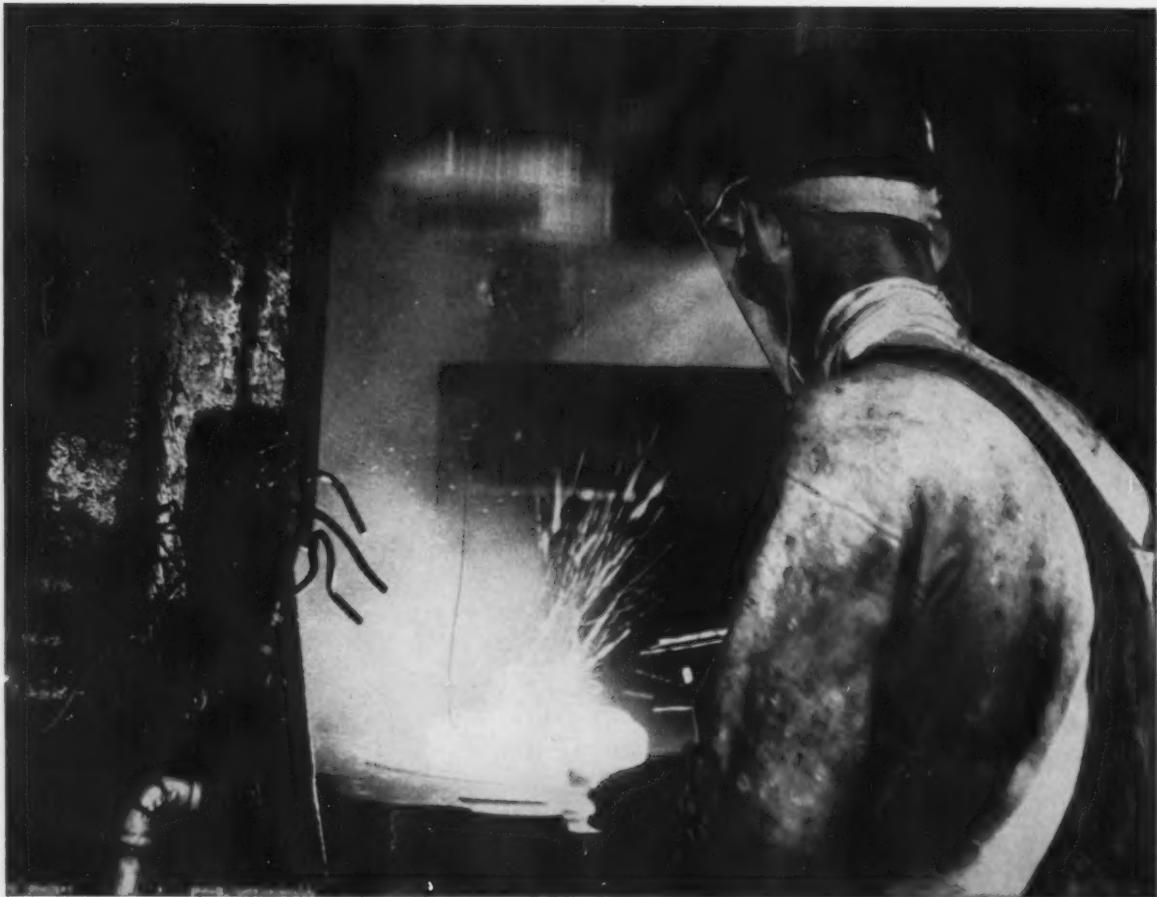
Only recently has a complete line of gas-fired Homocarb furnaces, equivalent in design, construction and instrumentation to electrically-fired units been introduced. Combining precision control of carbon potential with the economy of gas-firing, these furnaces can be used interchangeably for case carburizing, carbon restoration, homogeneous carburizing or hardening. These factors strongly influenced Muehlemeyer's choice.

A load of SAE 4140 steel slidebars being unloaded from Muehlemeyer's gas-fired furnace. Carbon and temperature control panels can be seen at right. Above is the same furnace . . . measuring 15 feet high by 6 1/2 feet in diameter . . . ready to leave the L&N shipping dock in Philadelphia.



For more information just write us at 4956 Stenton Ave., Phila. 44, Pa.

LEEDS  **NORTHRUP**
instruments • automatic controls • furnaces



Interstate Drop Forge Company—

20 Years a Cities Service Customer and Still Forging Ahead!



The modern way to cut a die is typified by die sinking machine, one of many at Interstate Drop Forge Company. All die sinking machines are lubricated by Cities Service lubricants.

With production running at roughly 1000 tons per month, Interstate Drop Forge Company of Milwaukee is one of the largest forging concerns in the Wisconsin area and growing all the time.

An integral part of this growth story, Cities Service is proud to have filled Interstate's lubrication needs for the past 20 years.

Drop hammers . . . helve hammers . . . upsetters . . . forging rolls . . . shapers . . . automatic metal saws. These are but a few of the diversified machines lubricated by specially tailored Cities Service oils and greases.

Actually, in a plant of this type with

so many differing pieces of machinery, it would be possible to have as many as 25 different lubricants. But, Interstate, with the aid of their Cities Service Lubrication Engineer has been able to standardize on twelve Cities Service lubricants.

Streamlining . . . standardizing . . . improving. These are some of the services a Cities Service Lubrication Engineer can render for your operation, too. Ask him to make a free lubrication survey of your plant. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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QUALITY PETROLEUM PRODUCTS



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Welded Stainless Pipe
from large local stocks

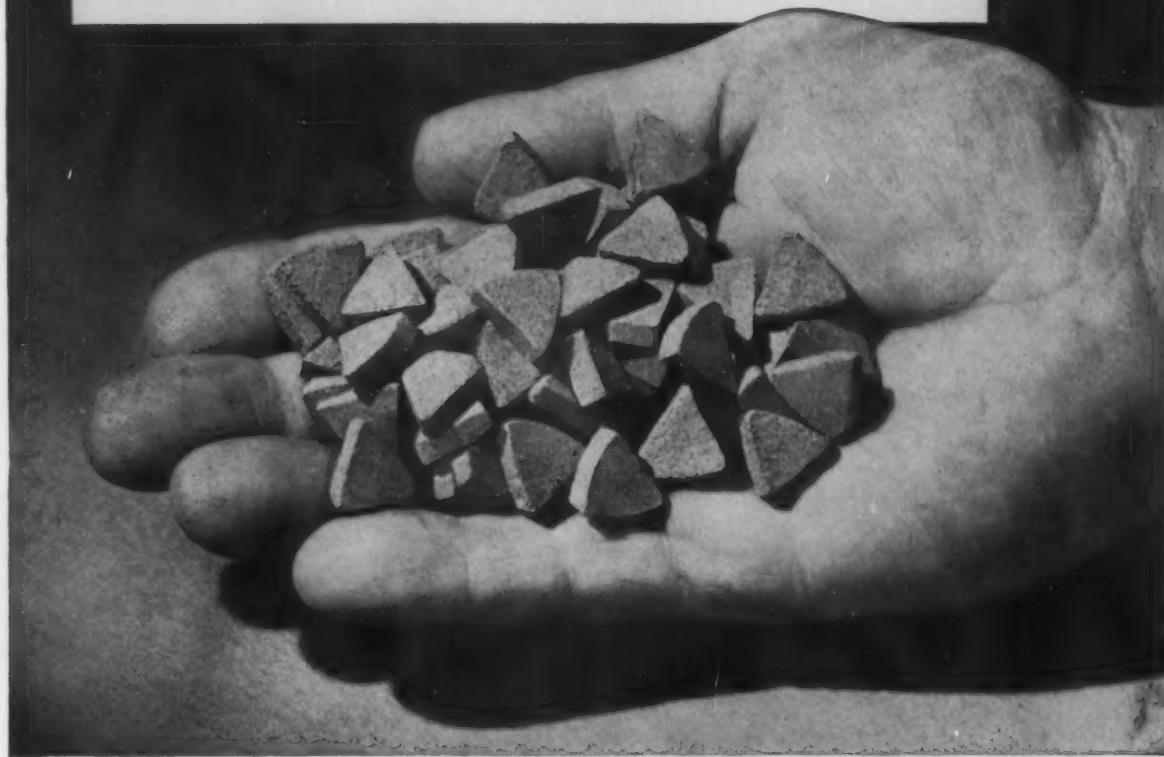
Call your nearby Carpenter distributor. He has stocks of
Schedules 5, 10 and 40 stainless pipe; sizes $\frac{1}{8}$ to 4 inches.
Call him today for fast delivery or information. The Carpenter
Steel Company, Alloy Tube Division, Union, N. J.

Carpenter 

Stainless Pipe

Leading deburring company
writes in:

To us, TUMBLEX® "T" abrasive
is literally a "Touch of Gold"



Describing one of the revolutionary Norton barrel finishing abrasives, this customer continues:

We formerly were stocking four types of finishing media. By switching to ALUNDUM TUMBLEX "T" abrasive we have eliminated three types and are getting better results. For example, one particular metal part required six hand operations prior to barrel finishing. Now, with your abrasive triangles, barrel finishing is all that's needed.

Made of bonded ALUNDUM® abrasive, TUMBLEX "T" has a triangular, non-wedging shape that's excellent for finishing intricate-shaped parts . . . provides long, even wear . . . assures fine, uniform finish, short time cycles and big savings in finishing costs.

Other Norton top-performing barrel finishing abrasives include ALUNDUM TUMBLEX "A" abrasive, for general usage; ALUNDUM TUMBLEX "S" abrasive spheres that get into hard-to-reach areas; and TUMBLEX "N" abrasive, natural stones for producing highest lustre on various parts.

Send samples of parts, any sizes or shapes, to our Sample Processing Department. We'll barrel finish, return samples and report the methods and abrasives you need. Or, when you're in this area, come in and look things over, personally.

NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

G-343

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

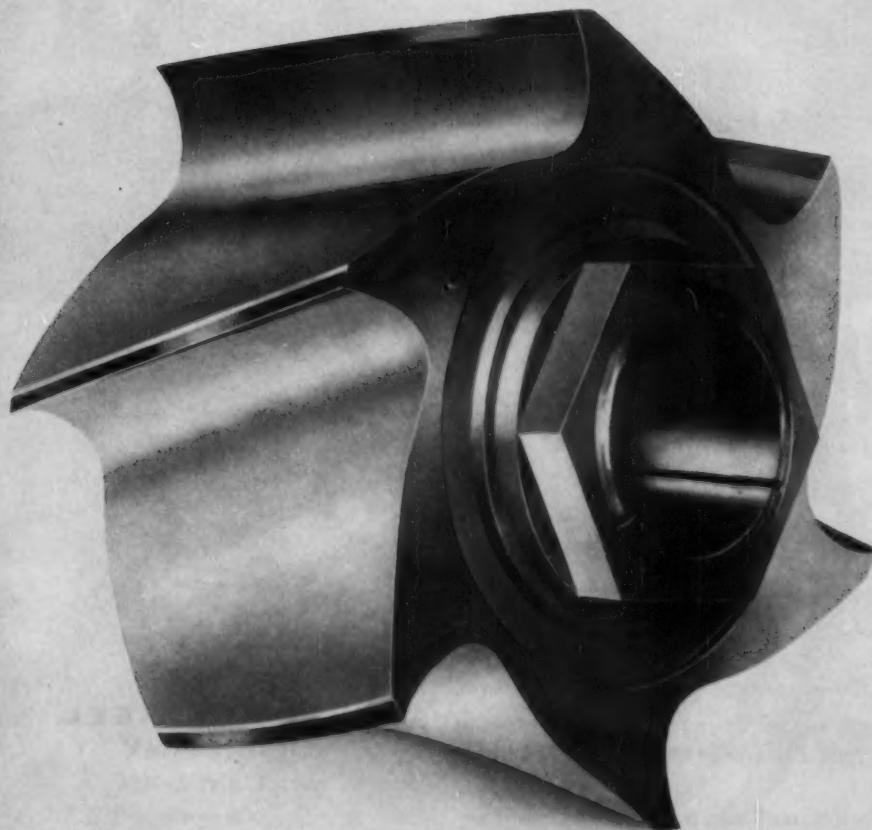
*Making better products...
to make your products better*

NORTON PRODUCTS

Abrasives • Grinding Wheels
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NOW: Higher strength costs you less! Specify TENZALOY*, the self-aging aluminum alloy that needs no heat treatment! TENZALOY is a corrosion resistant aluminum alloy that ages at room temperatures, gives high strength properties superior to those normally obtained only by solution treating, quenching and artificial aging. And these properties are stable, proved by conclusive test data taken over a ten year period. No special foundry techniques are required. No fluxes. Castability is excellent with sand cast and plaster molds, and many permanent molds. TENZALOY will not "grow". It takes a brilliant polish and anodizes clear white. Write for TENZALOY Bulletin No. 103 or call one of Federated's 22 sales offices. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

FEDERATED METALS DIVISION OF



AMERICAN SMELTING AND REFINING COMPANY

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*TENZALOY is one of a complete range of Federated aluminum casting alloys. These and hundreds of other quality controlled non-ferrous metal products are produced in the 11 plants of the Federated Metals Division.



MINUTEMAN!

Your steel service center starts delivery even as you place your order!

In every way, your local steel distributor is geared to keeping production lines rolling.

He's ready to rush the amount, quality, size and shape of steel to meet almost any conceivable demand—on the double. He's your on-the-spot insurance against the plant shutdowns and lost contracts that can be caused by in-plant steel shortages.

On a regular basis, his facilities, stocks and fast delivery service can be integrated with your production needs. He is, truly, the service center of the steel industry. And he's only a phone call away.

Call him for any quantity of Weirkote continuous-process zinc-coated sheets, Weirzin electrolytic zinc-coated sheets, hot- or cold-rolled sheets or any type of steel you may need for any type of production job.



**WEIRTON STEEL
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

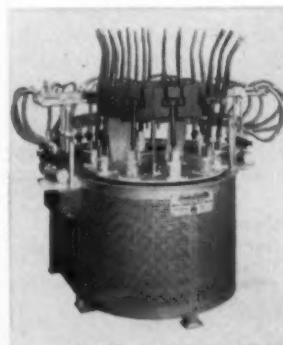
**Columbia produces
250 bicycle forks per hour
with automatic
GAS brazing**



Gas brazing is not new to Westfield, where Columbia bicycle frames have been brazed with Gas-fired Selas processing equipment for many years. During this time, pre-placing of brass filler material and automatic heating have limited dependence on operator skill, reduced material waste, and eliminated costly cleanup operations. With the installation of the new Gas brazing machine in their production operation, these advantages have been extended to include fork manufacture, also.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you'll get with Gas and modern Gas equipment.

American Gas Association.



Two fork styles in all standard bicycle sizes are joined from eight steel components on this new automatic Selas machine by Westfield Manufacturing Co., Westfield, Mass. Controlled combustion and flame geometry bring the parts to brazing temperature of 1750°F in only 86 seconds, using economical Gas equipment.

IMMUNOL

Reg. U.S. Pat. Off.

can be used to improve 22 metalworking operations!

Use IMMUNOL, the neutral, non-toxic, non-flammable, odorless solvent to improve your metalworking operations. This widely used product eliminates the fire hazard, is inexpensive and odorless. It is available in several grades to be mixed with water for:

Rustproofing

to protect cast iron and other ferrous metals against rust for long or short periods of time.

Cleaning

to quickly clean oil, grease, soil and dirt from any metal surface from small parts to heavy machinery.

Cleaning and Rustproofing

to leave a protective rustproof surface as it cleans, so minute it cannot be seen or felt.

Magnetic Inspection

to replace kerosene or mineral spirits and safely reduce costs, speed production, improve definition.

Adding to Soluble Oils

a 1:50 mixture gives cooler work, better tool life, better finishes, additional rust protection.

Buffing

to insure swift and complete removal in cleaning.

Plating

to remove all surface residues in preparation for plating and as an additive to final rinses.

Honing

to aid in heat convection and release stone dust.

Cutting

to increase penetration, lower surface tension, insure cooler work, better finishes.

Grinding

to increase heat convection of coolant, wet out metallic silt and wheel dust.

Tumbling

to shorten the cycle, insure cleaner, rustproofed work.

Degreasing

to reduce costs, improve results, eliminate dermatitis and other hazards.

Solvent Replacement

to remove cutting oils from machined parts, at lower costs, without hazards.

Hydrostatic Testing

to give water clear, rustproof solutions.

Quenching

to prevent rusting of tank and metals quenched.

Rustproofing Internal Systems

one part to 2500 parts plain water, prevents rusting.

Dispersing Silt

to facilitate cutting and grinding operations by dispersing and sinking metallic silt particles.

Heat Convection

to increase the convection property of plain water used for cooling, frictional heat or quenching.

Lowering Surface Tension

to insure faster penetration of liquids.

Emulsifying Fats

to carry them off and clean the receptacle.

Sealing Aluminum

after anodizing to produce a mirror-like finish, seal the pores of the metal and make it more resistant to contamination.

Replacing Vapor Degreasing

to clean better, rustproof the metal, eliminate odors, skin irritations, the dangers of fire.

Write for this free booklet. It describes in detail the many outstanding results users have obtained with IMMUNOL.



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TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

Tooling: key to longer roll life between redressings



Most difficult roll turning job done regularly at Mack-Hemp is dressing pipe mill rolls. Turning takes a week or more, with carbide tools reground three or four times per hour.

In a very important sense, block lathe turning practice sets the upper limit on the production-per-turn of every rolling mill in a plant. The reason is obvious. If the roll shop won't turn rolls whose hardness is above a certain figure, then the extra wear resistance of these harder rolls can never be brought into play.

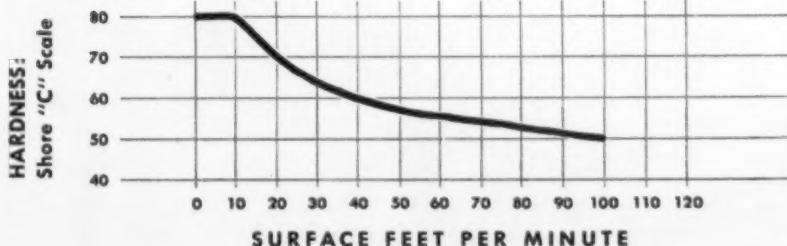
In investigating roll shop machining techniques,

we've found that many roll shop men are often not fully informed of the remarkable increases in turning speeds, feeds and depths of cut made possible by carbide tools. High speed cutting tools can dress rolls of hardness up to approximately 68 Shore (C scale), but carbide tools can cut harder rolls up to and including pipe mill rolls that are nearly 80 Shore. A set of these extremely hard rolls recently rolled 3500 miles of pipe between dressings!

Higher turning costs can pay dividends

At these higher-hardness levels, turning a large roll takes time and care; correct speeds must necessarily be selected and feeds are sometimes reduced to only a few thousandths of an inch. And even with a comparatively low rate of metal removal, the cutting tools must be reground after every few hundred surface feet. Three to four tools are worn out on every roll. But . . . the dividends in service life pay for the turning costs many times over.

Since Mack-Hemp specializes in rolls, roll turning and large roll contouring lathes, our experience in these three fields together with our awareness of the high tonnages available from the harder roll grades, helps us to make intelligent recommendations to our customers' best advantage. Suggestion: if you have had difficulty in the turning of hard rolls and want to explore their use in your mills, why not give us a call? Address Mackintosh-Hemphill Division, E. W. Bliss Company, 901 Bingham Street, Pittsburgh 3, Pa.



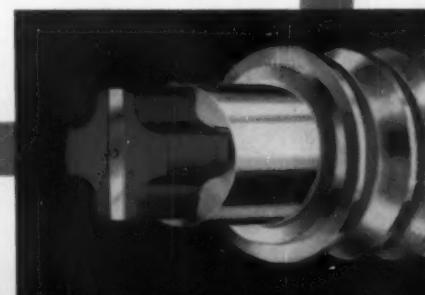
Cutting speeds (approximate) used by Mack-Hemp's machining department. Feeds and depths of cut vary widely depending on the roll and the power of the lathe available. These speeds are offered simply as a guide and should be adjusted to individual requirements.

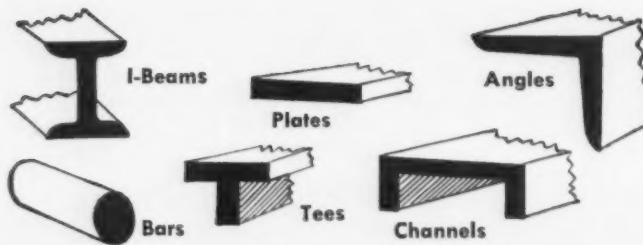
MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

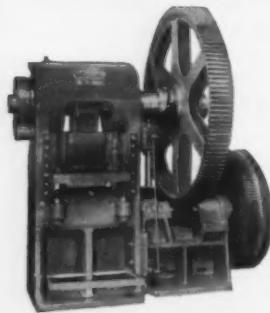
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If you bend, roll, shear, punch, plane or straighten any of these shapes of metal—
save time and money with

CLEVELAND FABRICATING TOOLS



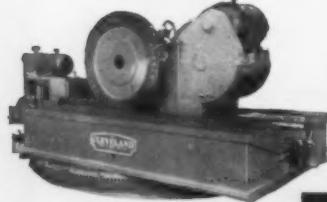
Bar Shears

Simple to operate, ruggedly built, Cleveland Fabricating Tools are designed for efficient, trouble-free operation and years of service.

Leading shipyards, railroads, bridge builders, boiler makers, and other structural steel and heavy plate fabricators have proven the dependable, economical performance of Cleveland Fabricating Tools.

Since 1880, Cleveland has engineered its complete line of fabricating tools to be the finest, most efficient for punching, shearing, bending, rolling, straightening, planing, coping and notching I-beams, tees, zees, channels, bars, rods and other structural shapes.

Write for Folder FT48 to help you determine the correct fabricating tool for your needs. AA-701



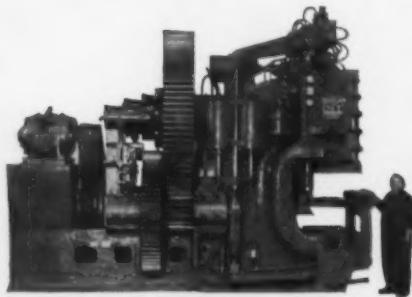
Rotary Planers



Bending and
Straightening Machines



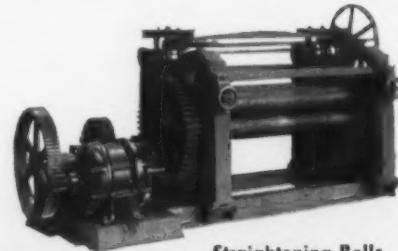
Bending Rolls



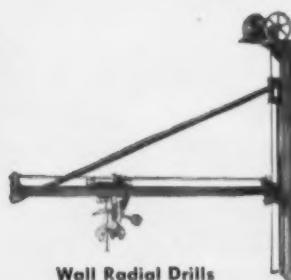
Vertical Open Gap Punching Machines



Horizontal Punches



Straightening Rolls



Wall Radial Drills



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The torque required to revolve the tongs is transmitted through the hollow square telescopic tubes. These flexibly connected tubes are designed with sufficient strength to safely support the trolley.

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"Give us the runway and we'll lift the world."

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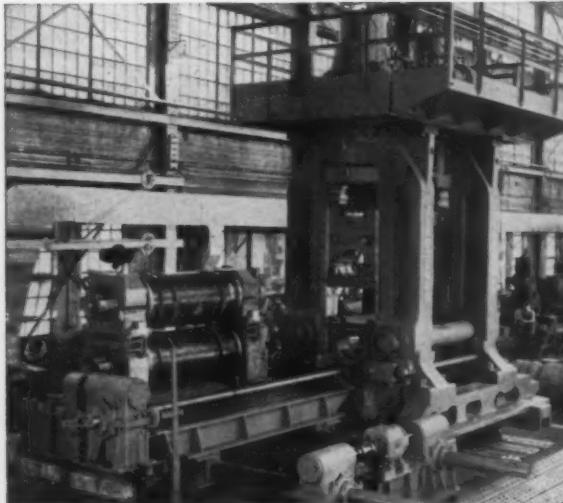
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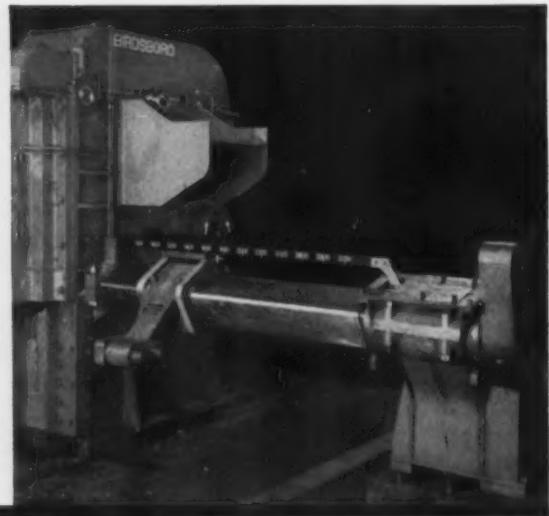
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•Whatever your particular profitability key unit is... It's sure to be designed, built, and worth more to your company, if it's produced by Birdsboro. Nowhere else can you get the value of more experience and skill... more background in working on outstanding industrial achievements.

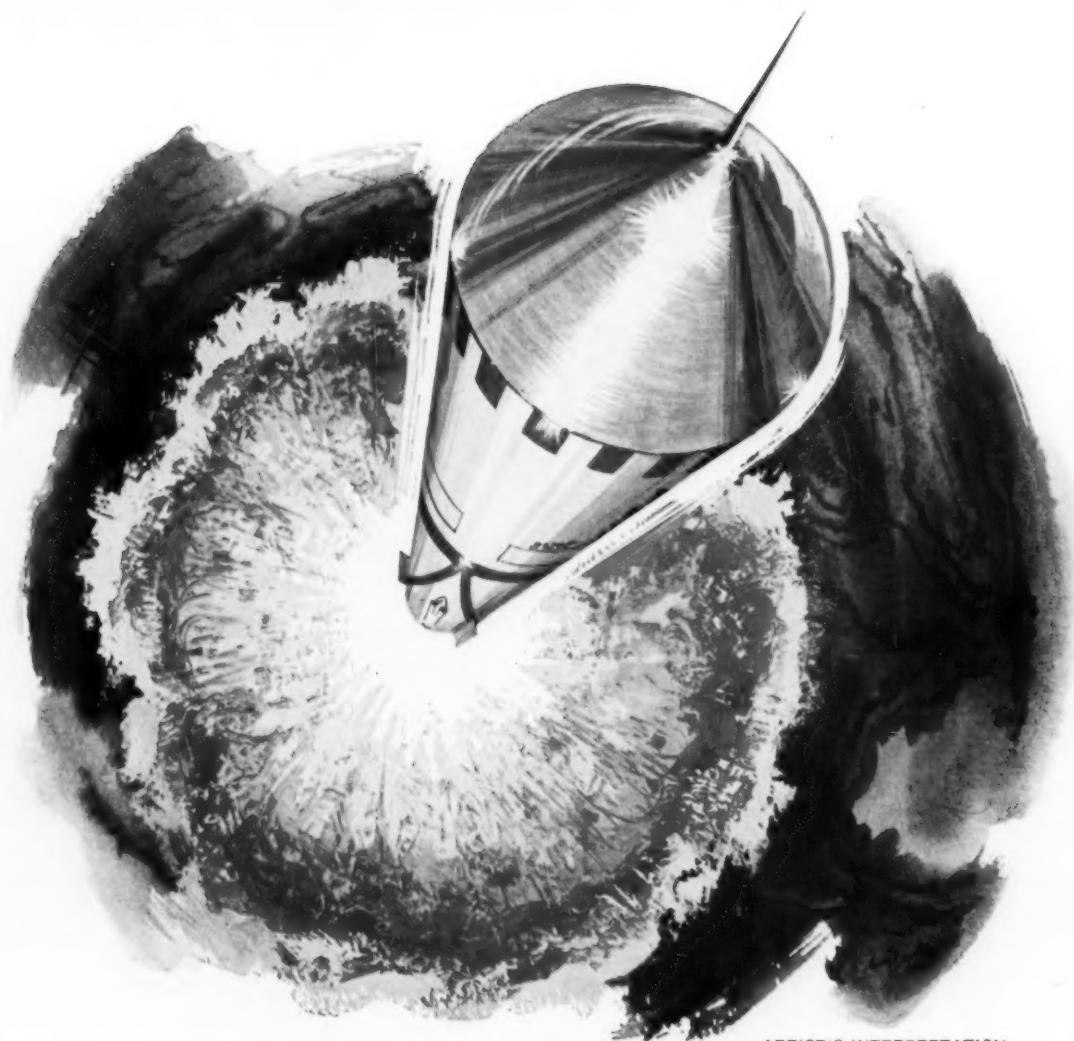
From one piece of equipment to a complete mill, Birdsboro's custom-designing of special machinery will work on the profit side of the ledger for you well into the future. *Main Office, Engineering Department and Plant: Birdsboro, Pa., District Office: Pittsburgh, Pa.*

MM-67-EB

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• ROLLS: Steel, Alloy Iron, Alloy Steel





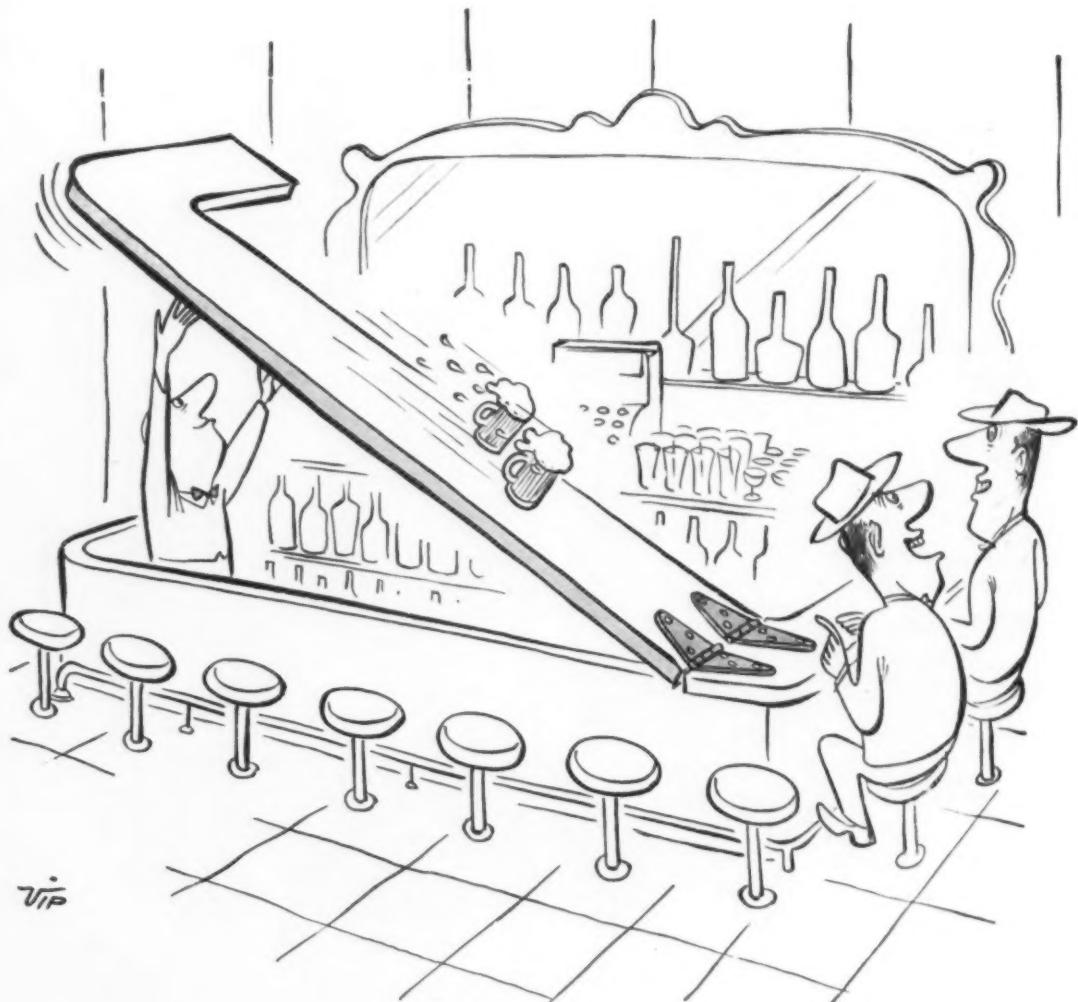
ARTIST'S INTERPRETATION

**There is no substitute for stainless steel
in outer space**

From the intense cold of outer space to the heat of a jet engine, Stainless Steel is the one metal that will stand up. In rockets, missiles and supersonic aircraft, Stainless Steel resists heat, friction and corrosion, has a high strength to weight ratio and maintains its structural integrity under the most severe conditions.

Specify McLouth high quality sheet and strip Stainless Steel. McLouth Steel Corporation, Detroit 17, Michigan.

McLOUTH STAINLESS STEEL



*"He's looking for a way to send Back
the empty glasses now that*

EVERYTHING HINGES ON HAGER!"*

We'll make **IT** for you! For standard (5000 different types and sizes) or special hinges, write or wire: C. Hager & Sons Hinge Mfg. Co., 1312 Victor Street, St. Louis 4, Mo.

Founded 1849, Every Hager Hinge Swings on 100 Years of Experience.



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Vacuum Cast Refractories

Refractory metals, such as titanium, molybdenum, or tantalum, can be melted and cast by a new process based on high-vacuum techniques. An electron gun setup does the melting. As electron stream from cathode bombards the melt stock, or anode, it melts and falls into a water-cooled crucible. The process can mold and refine powder, flake, or sponge metals.

Gage Records Cam Errors

With a new gage, a computer maker checks cylindrical cams to within 0.001 in. of required radius in one-sixtieth of the time formerly needed. The device measures 3-in. diam parts at 720 different points in just 12 minutes instead of 12 hours. The unit provides a permanent record of point-to-point cam errors and automatically warns of any out-of-tolerance condition.

Relates Exhaust to Fuel

Composition of exhaust gases from a gasoline engine has a direct connection with composition of the fuel used, according to new findings. The results are based on a new analytical technique combining chromatography with infrared detection. It determines individual hydrocarbons in concentrations as low as one part per million.

Static Controls Catch on

One of the newest pieces of automation equipment to come out of Detroit features all-static controls. The unit is headed for heavy electrical industry and is toolled to handle seven widely-varied part sizes and can be modified for more. The builder reports more manufacturers are demanding static controls because of excellent service life.

SUB Helps Affected Areas

Trade activity in Pittsburgh this year is equaling or bettering last year's levels even though unemployment is proportionately greater than in past declines. Nationwide, steel SUB funds

had paid out \$20 million through April. Payments are currently running \$8 million a month and \$24 per individual. Seven steel mills are included among 24 companies going into reduction tables, but several big mills have their funds over the 100 pct level.

Fast Check on Low Carbon

A new, simplified technique has been developed for determining very low carbon contents in iron, steel, and ferrous alloys. It's rapid and accurate even for carbon levels below 0.1 pct. Average determination takes about 25 minutes to complete. Accuracy is said to be comparable to that provided by gravimetric methods.

Stress Missile Reliability

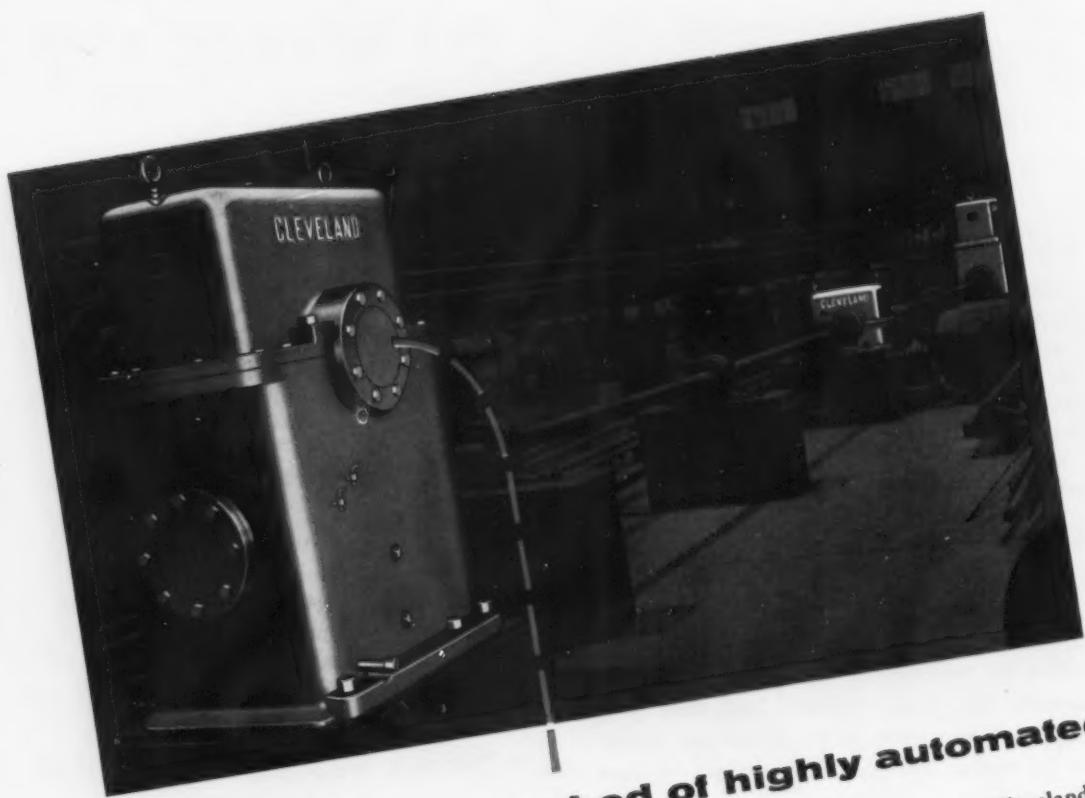
Improved guidance and propulsion components are being developed with the aim of producing simpler, more reliable missiles. Guidance systems are to be made lighter, more accurate. Propulsion systems researchers will explore both solid and storable-liquid propellants. Work calls for heavier missile program spending. In 1959, obligations are to reach \$6.4 billion.

Ultra-Miniature Circuits?

Still smaller, simpler circuits appear closer through work on new class of ultra-miniature, integrated electronic devices. Unit now being developed, a shift-register transistor, is 1/2 in. long, 0.004 in. thick. With further work, it is expected to perform functions of 20 transistors, 40 resistors, or 20 capacitors.

Benefits from Report Form

Developed by a veteran purchasing agent for his own use, a new report form is finding rapid acceptance. Each class of items purchased is listed with total expenditures for that month, for instance expenditures for electric motors. It's also applied to power, heat, and light costs. Besides telling management dollar outlay by item per month, the report has benefits in planning purchases, production schedules, and cost analysis.



**Clevelands drive cooling bed of highly automated
Canadian tube mill**

Here is the cooling bed—driven by 3 Cleveland speed reducers—of the world's first completely automated seamless tube mill. It was built by Mannesmann-Meer Engineering & Construction Co., Inc., Easton, Pa., and installed at the Sault Ste. Marie plant of Mannesmann Tube Company.

Practically everything in the entire plant is automatic—handling of materials from stage to stage, as well as individual operations.

You'll find Clevelands in nearly every steel plant in America—wherever dependable, heavy duty drives are demanded—many of them in continuous service upward of 35 years. Write for new Bulletin 145 which shows the many types available in the Cleveland line. The Cleveland Worm and Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.



Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers



TOP BRASS: Bethlehem Steel's Homer with U. S. Steel's Hood and Blough at Iron and Steel Institute meeting.

Steel Men Point Up Bright Spots In Gloomy Market

Although there is little to cheer about, steel industry leaders are not depressed.

Most believe the market has hit bottom and is on the way up again.

Higher wage costs are expected to force prices up despite slow demand.

■ Steel men attending last week's 66th general meeting of the American Iron and Steel Institute had little to cheer about. But few of them were singing the blues.

Despite a slow market and the

prospect of being forced to raise prices on July 1, there was a surprising feeling of optimism in the corridors of the Waldorf Astoria Hotel in New York where the steel executives gathered.

The bright spots—Finding a silver lining in the dark clouds was not easy, but the steel leaders managed to point out a few. For instance:

Money spent over the years for modern and more efficient equipment is now paying off. The mills are congratulating themselves on this for the simple reason that more efficient plants have offset the im-

pact of the business downturn.

Orders hold steady—Most steel people feel that the bottom of the recession has been reached. While keeping their fingers crossed, they point out that order volume has kept on an even keel during the last three to four weeks. One company reported that last week was its second best of the year.

As noted in *The IRON AGE* last week, there has been an influx of new business from relatively small customers, such as stampers, appliance parts makers, and automotive parts makers. This could portend, according to market observers, a pickup in demand from

big-time users such as the automotive companies.

Linepipe revival?—Steel men are getting the word that the pipeline companies may be coming back into the market soon. Indications are that these firms will not wait for a final decision from the U. S. Supreme Court on the famous Memphis court ruling. This ruling, which had to do with the mechanics of setting oil and gas rates, forced the pipeline companies to reconsider expansion projects. It's now rumored that two or three major linepipe orders will be on their way to mills in the near future.

Steel leaders contacted by The IRON AGE look for a definite market improvement at least by October. Most believe the uptrend will continue through the last quarter of '58, followed by an even more significant show of strength next spring.

Outlook on prices—The steel men were not hesitant to speak up on the need for higher prices when wage costs go up on July 1. In most cases the mills will be on the hook for an additional 20¢ an hour

under their contracts with the United Steelworkers of America.

Roger Blough, chairman of U. S. Steel Corp., said that no decision had been reached on prices. But this was not surprising. At no time in the last 25 years has a U. S. Steel executive indicated in advance how much, if, and when prices would rise.

Armco positive—R. L. Gray, president of Armco Steel Corp., said flatly that his prices would go up on July 1 regardless of what other mills would do. He admitted, however, that if other mills failed to raise prices his company probably would have to bring its quotations back into line.

Avery C. Adams, president of Jones & Laughlin Steel Corp., reiterated his view that price increases averaging \$10 per ton would be justified. At the same time he conceded that the price boost probably would not amount to that much.

How much?—Some executives said they thought the increase would average \$4 per ton, while others agreed with The IRON AGE estimate that the weighted average

would be closer to \$6 than to \$4.

At least part of the current pickup, however slight, is being attributed to hedging against an expected price boost. While there are signs that low inventories are forcing some users back into the market, it's conceded that others could hold out but are buying now to beat a price increase.

Summer slump seen—Most of the steel leaders look for the market to take another dip in July. Many metalworking companies are planning July vacation shutdowns and are not likely to be taking in any steel during that period.

Benjamin F. Fairless, Institute president, in a key address, called for a "dynamic" tax program that would maintain Federal revenues but at the same time would encourage business expansion.

Mr. Fairless said that the revised tax program he envisages "will have to be more realistic than the present unplanned patchwork of measures, most of which were hastily adopted to finance wars and seldom, if ever, revoked."

Armco's Gray recommended a middle ground between extremes of free trade and protectionism as a solution to the country's foreign trade problem.

Awards Made—J. M. Stapleton, assistant to Vice President, Iron Production, U. S. Steel Corp., received the AISI medal for his technical paper, "Development of Controlled Air Distribution for the Blast Furnace," read before last year's general meeting.

John R. Hunt, chairman, Operating Committees, Tennessee Coal & Iron Div., won the regional technical meeting award in the field of operations for a paper on blast furnace practice.

J. G. Sibakin, metallurgist, The Steel Co. of Canada, Ltd., received the regional technical meeting award for the best paper in the field of research for a paper entitled "The Development of Optimum Ingot Sizes for Flat Rolled Products."

What Steel Men Are Thinking

B. F. Fairless, president, American Iron and Steel Institute:

"We must work to achieve a balanced, overall movement forward—with wages, profits, and productivity going up together in step. We shall never be safe from recession or worse until this is done."

D. S. Holbrook, president, Algoma Steel Corp. Ltd.:

"A very real improvement in Canadian steel affairs is directly attributable to the fact that Canada's depreciation tax laws have been more favorable than those in the United States for the past 10 years."

R. L. Gray, president, Armco Steel Corp.:

"The increasingly painful effects of foreign competition in our domestic markets point clearly to the need for extreme caution in moving any further in the direction of free trade."



OFF FOR RUSSIA: American steel men embark for Russia. IRON AGE's G. F. Sullivan is third from left.

Iron Curtain Open for Steel Men

First, big American steel mission leaves for Russia.

It will tour mines, mills, and research centers studying methods, processes and labor relations.

Soviet steel group scheduled to tour U. S. mills soon.

■ Soviet Russia may actually have made more steel last month than the United States. April production for each was five million net tons, give or take a hundred thousand tons.

Actually, the USSR's steel ingot capacity is probably about 60 million net tons compared to the U. S.'s 140.7 million tons. But it may be the Soviets have temporarily over-produced in recent months. This could explain the recent decision to cut the work-week in the steel industry from 46 hours to about 40.

The average U. S. steel industry worker is now putting in about 35 hours per week.

Russian Tour — Last week, an American steel delegation took off from New York on the first leg of a 3- to 4-week tour of steel mills, research centers and iron mines of the Soviet Union. Included in the group is G. F. Sullivan, editor of The IRON AGE.

This is the first industrial delegation to visit the USSR under new exchange agreements between the two countries. Several foreign groups, and some American individuals, notably Dr. D. J. Carney, of U. S. steel, have visited Soviet mills and research centers, and a U. S. metallurgical group toured Russia last year.

Soviet Power — In America, as throughout the Free World, some people overestimate the power of

the Soviets. Some underestimate it. In many areas there is a real fear of Russia's military might; in others, almost complete ignorance of her economic potential.

"Let's agree on this," said Premier Nikita S. Khrushchev to U. S. Ambassador L. E. Thompson, Jr., in Moscow last month, "when we win this [economic competition with the United States] we shall also re-educate you. . . . We Bolsheviks are ravenous people. . . . We want more —tomorrow. . . . We're stepping on your tail."

Iron Curtain Competition — In nonferrous metals and ferroalloys some tails have already been stepped on. Steel is now being exported. What next? More steel, zinc, tin, aluminum? When may it reach machine tools and consumer goods? ☐



HIGH HOPES: New product is checked by Market Forge's L. M. Beckwith (r), and Samuel Sheldon.

How a Supplier Turned Producer

Market Forge Co., one-time subcontractor, reached a day when it had to branch out.

By using sound market judgment, it was able to profit with a product line of its own.

■ Within the next month, a \$5 million a year former job shop will launch a new product—an automobile back-rest—on which it has invested two years of research and development, \$100,000 worth of sales promotion, and the cost of a new 30,000 sq ft plant.

In the light of the current business downturn, is this courage or temerity?

To listen to Leo M. Beckwith, president of 60-year-old Market Forge Co., Everett, Mass., it's just plain "good business."

Sales Curve Up—Mr. Beckwith points out that during the past 10

years, since his company began turning out its own products, sales have more than doubled. In the first four months of this year, business has climbed 15 pct over the same period a year ago. Why?

Mr. Beckwith says there are four major reasons: Well designed new products that meet a definite need, low prices, a hard-hitting team of manufacturers' representatives, and a company tradition for giving more than it promises.

It Took Time—But all was not smooth sailing for Market Forge 10 years ago. The company was being buffeted on the heavy seas of a buyers' market. Sales volume had such widely fluctuating peaks and valleys from month to month that it was difficult to plan ahead.

Mr. Beckwith and his vice president, Sam Sheldon, put their heads together and came up with the

solution — proprietary products. They felt if they could find items the public really needed, design and manufacture them better than anyone else, and sell them energetically, they could level off the peaks and valleys.

So they dipped down into their lean financial reserve and put together a research and development department.

The first product developed, a stainless steel commercial pressure cooker, did so well that the company began looking for other new products. It hit on a die-formed, one-piece auto top carrier that tripled its sales in the first year and made Market Forge the largest producer in the field. There were other products, the latest of which is the new back rest.

The company found its sales could best be handled through manufacturers' representatives.

Automation Lures Foundrymen

They Reveal Keen Interest at Cleveland Show

High-speed, automatic equipment was the main attraction for founders.

Foreign companies aim at U. S. market, exhibit wares for the first time.—By T. M. Rohan.

■ Visitors at the 62nd annual Foundry Show in Cleveland looked longer and harder at new equipment than they have in years—apparently feeling that in the present market it's modernize now or never.

Total attendance during the first three days was 10,000, somewhat less than in previous years. But the brass was there in force looking for money-saving ideas.

Pangborn Corp. of Hagerstown, Md., sold nine carloads of equipment in two days. Japanese visitors also peeled off a roll of bills to buy vibrators over the counter.

Crowd Pleasers—Biggest technical attention-getter was not an exhibit at all, but a movie. The film, premiered at Cleveland, showed a completely mechanized foundry in Schaffhausen, Switzerland, operated by nine men and turning out 300 molds per hr. It was completely automated from core making through pouring of the malleable castings at a rate of 36,000 tons per year.

Exhibitor was American Automation Co. of Ann Arbor, Mich., whose American representatives assisted in the six-year design program with the staff of the George Fischer Foundry in Schaffhausen and Erwin Buhler, European foundry consultant. It has been in operation 1½ years and the system is now being offered in the U. S. by American Automation.

Improved Cupolas—Water-cooled cupolas are becoming suitable for medium size foundries but still are a little steep for small

foundries and not practical without hot-blast equipment. Modern Equipment Co. of Port Washington, Wis., had a closed circuit, live TV hook-up with Ford Motor's Cleveland foundry showing one of their cupolas in operation. Whiting Corp. of Harvey, Ill., had an actual one on display. These basically substitute water cooling systems for heavy linings common in other cupolas.

A new type hot blast air heater for cupolas was shown by Brown Fintube Co., Elyria, O. In addition to the original single section type, Fintube now has built a multiple section type in which chambers can be closed off one by one rather than throttling down the whole unit.

Coremaking—Shell molding is starting to find its level in the foundry industry after a meteoric start about 10 years ago followed by a decline in general interest. Big market now seems to be in making quality cores fast and cheap. Shalco Corp. of Palo Alto, Calif., and

Cleveland, showed a 78-lb shell core for a pipe T-section made in 5 min cycle time at Kuhns Bros. Co., Dayton, O., with their machine.

SPO, Inc., of Cleveland, showed an automated coremaking machine which laid a complete core on a conveyor. Bulk of machines shown were still high production types not feasible for job foundries.

Europeans Exhibit—Substantial exhibits of British foundry machinery built on a completely different theory from most American units got lots of interest. British Molding Machine Co., Ltd., of Faversham, Kent, showed automatic straight draw and turnover type holding machines and allied handling equipment in operation.

F. E. (North America) Ltd. of Toronto announced its entry into the American market and showed an automatic molding machine, core blower, shell molding and handling and conveyor equipment working.



NEW AFS OFFICERS: L. H. Durdin (left), head of Dixie Bronze Co., is president-elect of the American Foundrymen's Society. C. E. Nelson (right), director of the Magnesium Div., Dow Chemical Co., is vice president-elect.

The Heat's on Aluminum Prices

Upcoming wage increases put the pressure on U. S. producers for higher prices.

But Canadian competition may force them to hold the price line.—By F. J. Starin.

■ "Prices have to go up, but they probably won't."

This is the opinion of a representative of one of the major U. S. aluminum producers. Most of the industry believes his conclusion is a little hasty. But it does point up the knotty problems facing the big U. S. producers this year.

Each of the domestic Big 3 says it needs a price hike. The target date is August 1, when union contracts call for wage and fringe hikes estimated at 15¢ to 20¢ per man per hr. One company says this will up its production costs by about 7 pct.

Competitive Angle—But each of the Big 3 has also been saying it's ready to meet its aluminum-making competitors. These ideas may conflict. Then U. S. producers will

either have to swallow their cost increase or give some competitors an advantage.

Alcoa, for instance, says it "can't absorb a 20¢ employment cost increase and maintain profit margins which have already shrunk to a poor level in relation to investment." On the other hand the company asserts that "Alcoa prices must remain competitive . . ."

An aluminum executive says there are too many small fabricators hungry for business at current prices for producers to raise their rates. But probably weighing more heavily on producers' minds is Aluminium Ltd., the Canadian producer who is shipping large tonnages of ingot to the U. S. Aluminium Ltd. has demonstrated its willingness to act independently of U. S. producers.

Keeping Mum—The Canadian company forced a 2¢ price cut in April to stimulate more use of aluminum in place of competitive materials. Aluminium is not ready to say what it has in mind for August, but there are indications it doesn't

favor a higher price.

The most recent statement of company thinking was April 24, when company president Nathanael Davis told stockholders, "Aluminum with all its excellent properties still has to win wider acceptance in competition with other materials . . . In highly competitive fields . . . small variations in price may radically affect acceptability . . ."

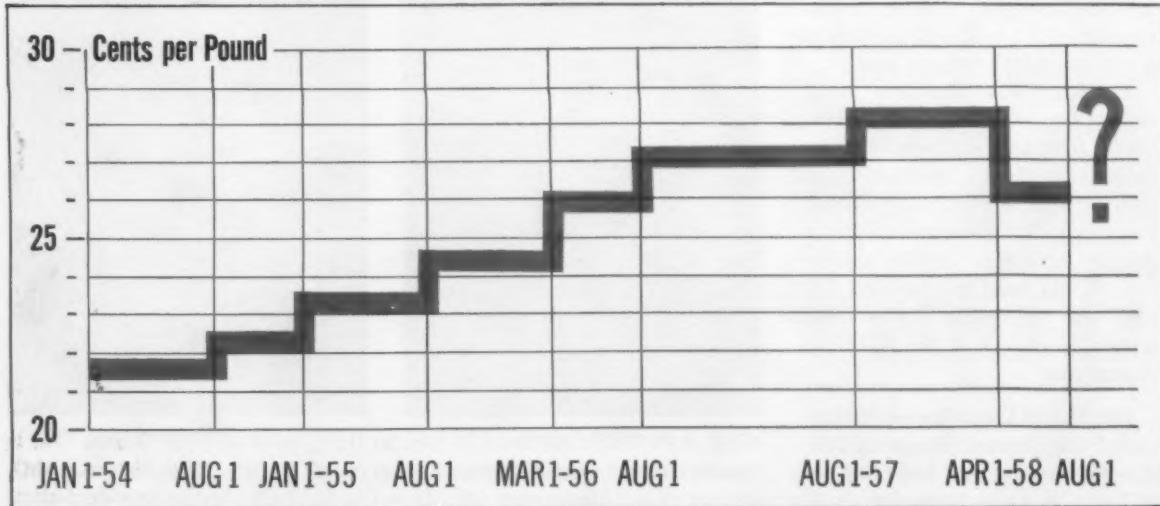
Costs Are Secondary—Other company spokesmen say, despite comments from U. S. producers to the contrary, the lower price is having the desired result of stimulating aluminum sales.

How bad do U. S. producers need a higher price? Annual reports for 1957 show they are feeling a profit squeeze. Despite the start of the recession, dollar sales of all of the Big 3 were up, from less than one pct to 14 pct. But net profits were off sharply, from 8 pct to 37 pct lower.

Trend Continues—First quarter statements show no reversal of the trend.

Aluminum Approaches Price Crisis

Will Ingot Price Start Climbing Again?



Aluminium Ltd.'s financial position appears no stronger. Sales and net profits were both off in 1957 and in the first quarter. And the company claims it has no advantage in labor costs.

Aluminium president Nathanael Davis says, "The company's labor rates in Canada are already comparable to the highest rates paid in the industry anywhere in the world."

A U. S. labor expert asserts Aluminium's wage advantage over U. S. producers, at its Quebec plants, is from 28¢ to 57¢ per man per hour.

The Canadian company reports that on September 17 its wages will be upped from 9¢ per hour on base rates to 17¢ for highest paid help, plus a cost of living bonus.

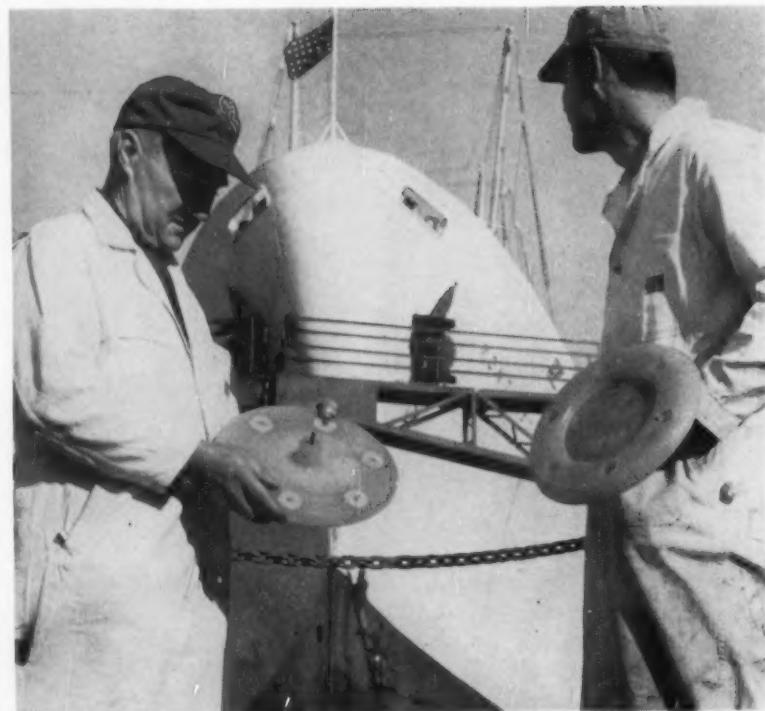
At a recent hearing before the House of Representatives' Small Business Subcommittee (Yates Committee), Aluminium president Davis said he was more concerned about tariff reprisals than competition from domestic producers in the matter of a lower price. This may become a factor, but not because of Aluminium's price position.

Tariff Talk Revives—Imports of mill products are hitting East Coast markets in increasing tonnages. And they are being quoted at 10 to 20 pct under U. S. prices.

Also, aluminum is not mentioned in the Seaton Plan to subsidize several domestic nonferrous industries. R. S. Reynolds, president, Reynolds Metals Co., has pointed out this gives an unfair edge to some of aluminum's competitors.

There is growing sentiment to seek help for aluminum by reimposing a tariff. The industry is by no means united on this. Leonard Starr, president, Aluminum Extruders Council, has indicated his group's tariff opposition, to the House Ways and Means Committee.

In making up their minds on a price hike, U. S. producers must also calculate the net effect of the ending of fast writeoffs on some of their plants and facilities.



PROTECTION: Charles Engelhard, Inc.'s Capac, platinum disks in plastic holders, will protect a ship hull from corrosion indefinitely.

New Platinum Market

Charles Engelhard Inc., has a cabin cruiser moored in a stream across from its East Newark, N. J., plant. Company technicians and executives spend as much time as they can on it—but not relaxing.

The boat is being used to test what looks like one of the hottest new markets for platinum—cathodic protection from corrosion. Engelhard's trade name for it is Capac.

Neutralizes Currents—A series of thin platinum disks in polyester-plastic holders are attached to a metal surface. An electrical charge neutralizes natural galvanic currents in the immediate disk area which would cause corrosion.

At present Engelhard is aiming all its marketing guns at the marine market. It already has about 100 tankers, warships, and luxury liners protected with Capac. The com-

pany views its market potential as almost every sea-going vessel.

New markets are absolutely vital to platinum. Because of its high cost, scrap recovery consistently runs close to 100 pct. Unless new, expanding markets are found a large surplus of new production will develop.

The three largest sources of platinum are Canada, South Africa, and Russia.

Industrial Use Gains—More industrial use has been the haven in the storm. A leading platinum refiner estimates industry's share of the market has grown from about 60 pct to about 90 pct in the last 10 years. However, the amount of platinum used for decorative and artistic purposes has fallen only slightly, indicating the shift is due to new and expanded industrial uses.

Probing the Mysteries of Iron Making



OPERATION DEEPFREEZE: U. S. Steel scientists want to know more about iron making. Their technique: To "freeze" a Bureau of Mines experimental blast furnace in midcycle with a blast of nitrogen. Sample of loose materials was taken. And workers also made 20, 3-in. diam core samples (above) of the solid mass of coke, metal and slag.

AISI Revises Form 7 To Speed Reporting

Faster and more detailed reporting of iron and steel production has been promoted by a revision of American Iron and Steel Institute's form 7.

Features of the new form include breakdown of production by 13 state groupings, instead of the six AISI districts previously used, and addition of stainless and heat resisting steel ingot production figures. In the past, steel output breakdown included only carbon and alloy steel.

Other Changes — The revised form 7 now comprises two sheets,

with blast furnace capacity and production on the second. Blast furnace statistics are now also reported for the 13 state groupings, rather than by districts. The revised table gives only total blast furnace capacity and output, omitting the breakdown of production into pig iron, ferromanganese and spiegel.

The steelmaking table also includes a compilation of ingot tonnage lost through work stoppages.

AISI says the new listing by state groupings yields more detailed statistics and brings the form more nearly in line with Government reports.

Stainless Improvement — The revision also gives stainless steel

production figures on a monthly basis. These have not previously been available except on a quarterly basis, when production by ingot types is reported on AISI form 104.

Openhearth and electric furnace output figures are reported for both ingots and steel for castings. Bessemer ingot production excludes steel from 10 furnaces used only for duplexing. Basic oxygen, bessemer and crucible furnace capacity, number of furnaces and number of companies operating, are now reported separately. But production is still included in electric furnace totals.

Vote for Strikers?

Strikers should be allowed to vote in union-representation elections, says Sen. Clark, (D., Pa.). He is urging this revision of the Taft-Hartley law on his Senate colleagues now engaged in drafting a labor reform law.

The way the law reads now, says Sen. Clark, employers can use strikes to break unions. For example, they refuse to concede anything in bargaining, and let the employees strike. Then they hire non-union help. In a plant election to accept or reject a union, the new employees vote the union down.

Senate leaders have promised to have their labor reform bill on the Senate floor by June 10. Democrats and Republicans running for re-election would like to see the bill stuffed in a bottom drawer until this year's session is over.

Mold Business Good

A survey by the Society of the Plastics Industry indicates mold manufacturers, and custom and proprietary molders, are enjoying a good year.

Replies report first quarter sales range from just about the same as the first quarter 1957 to 40 pct improvement over that period.

One manufacturer reports his 40 pct increase in business has boosted dollar volume 75 pct, and profits by about 10 pct.

NEWS ITEM No. 4 - 1958 - NEW PLANT IN STURGIS, MICHIGAN



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John B. O'Connor

Planning to Win World Markets

The rivalry between West and East will ultimately be decided in the market place, says this oil industry executive.

He draws his conclusions from years of travel and dealings with the Russians.

■ John B. O'Connor is a Texan who admits that the world is bigger than Texas—especially the business world.

The well-traveled president of Dresser Industries, Inc., Dallas oil-field equipment producer, is convinced that greater American investment abroad is vital to an improved U. S. world position, both economically and politically.

One Good Turn—“It is too easily forgotten that in the infancy of our own great Republic, it was the investing of foreign capital that built the U. S. into a first class power,” he asserts. “Let us . . . finance and build the dams, the steel mills, the communications systems so sorely needed to improve their standard of living.”

As a hard-headed businessman, Mr. O'Connor insists that this policy will pay the U. S. dividends. We must build up the buying power of undeveloped countries if we are to create a market favorable to ourselves, he explains.

Facing the Facts—Mr. O'Connor recently came in for some public criticism when his company decided to buy from Russia a turbodrill for drilling oil wells which he describes as a “superior tool.”

“The best way to know a people is to trade with them,” he advises. “There is no surer way of learning how a man thinks than to get your



J. B. O'CONNOR: (left) Recognition at St. Bonaventure University.

feet under the same table in a horse-trading session . . . Americans often do not give foreigners enough credit for their abilities.”

An Inventive Mind—While John O'Connor is ready and willing to give credit to others, he has some coming himself. Among his “firsts” are the development of high-speed engine-driven angle compressors for oilfield equipment.

He built one of the first represuring systems in America. And he built the first gas liquefaction plant in Russia. While in Moscow two years ago, he recalls “It was hard for me, as an American, to admit that the Russkies had come up

with a superior tool for drilling oil wells.”

Stresses Economics—He believes that the “battle for men’s souls” that is going on today between Russia and the U. S. is less likely to burst into a shooting war. “This is a war of economics,” he says, “and the immediate objectives are markets. This is because the power that controls the market place of the world will dominate the minds and souls of men.”

To help maintain our technical superiority, Mr. O'Connor goes on record as endorsing a joint effort in the American business community for pooling science resources.



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Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong,

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Price Problem Not Understood

The President's speech raises the question of whether the full price picture is understood in the Administration.

Industry wants to hold prices, but wonders how it can with built-in cost increases.

■ The mixed reaction to President Eisenhower's address to the American Management Assn. last week points out that business is operating under a different set of rules today.

In many of his points, the President implied a flexibility of action that business just does not have in this era. This is particularly true in the case of prices.

Not Realistic — His urging of price policies based on "pricing for volume" and taking chances on profits is stirring talk. But it isn't realistic to a company executive restrained on every side by fixed or climbing costs.

Furthermore, there is a lot of evidence that the demand curve is not as susceptible to price changes as the classic economists, and apparently the President, believed. Today's consumer is governed by many forces, only one of which is price.

Labor Costs Climb — The average manufacturer is confronted with fixed or increasing labor costs, climbing freight and other transportation rates, and increasing costs of materials.

Then too, many companies are confronted with fixed costs of paying off new capital equipment which, in many cases, is not operating at nearly the capacity it was purchased for.

Where to Cut? — Where can a manufacturer cut costs? It's gen-

erally limited today to the areas of more efficient management. Many companies have cut salaries, pared non-productive costs to the bone. But in many cases a new emphasis on hard selling has increased even the cost of selling.

There is no question but that prices constitute the most pressing

problem of the top executive today. Emotionally, he would like to cut prices. But, realistically, he may be faced with the prospect of raising them only as little as possible.

Most executives wanted to agree with the President last week. But many privately thought he didn't see the entire picture.

Businessmen in Government

Few people get less sympathetic treatment than the businessman in government, frequently an unwilling servant to the need for executive ability in the giant Federal bureaucracy.

Some rare insight to this facet of government is provided in a new study of the businessmen in government just completed by the Harvard Business School Club in Washington, D. C.

Little Self Interest — Here are some high points of the survey:

For one thing, the report concludes he is neither "the dragon of self interest nor the angel of duty." Instead, he is more often "a welcome addition to the official family who serves despite a frightening lack of interest in the business community for participation in government service."

Most From Manufacturing — Forty-one pct of the BMG's came from manufacturing, with 11 pct from service industries, the next highest category. Since pre-World War II, the number from manufacturing has progressively increased.

Before going into government service, 37 pct were administrators, with sales executives next at 22 pct, production men 8 pct, finance 5 pct,

and 3 pct each from accounting, personnel and promotion.

Turnover High — One important point raised by the survey is the high rate of turnover—set at 33 pct annually—which, the survey says, "raises the question of whether the period of service is adequate."

Why do businessmen resist government work? Although conflict of interest touched very few, this was one of the big reasons for hesitancy to enter government work.

Low pay, how long to leave business, and the belief that government is radically different from business were other reasons.

He Is Appreciated — Although the average person who leaves a good position in private industry to take a government job probably feels he is not appreciated, the survey indicates otherwise.

"The majority of top civil servants surveyed were complimentary of the businessman's ability and found him flexible, open-minded, patient, with ability to get things done and deal diplomatically with Congress," the survey states.

In a profile of the BMG, the survey found the typical one to be about 45 years old when he starts government service. He had a salary of \$14,600.



Lodge & Shipley POWERSHIFT PRESELECTOR GIVES PRODUCTION

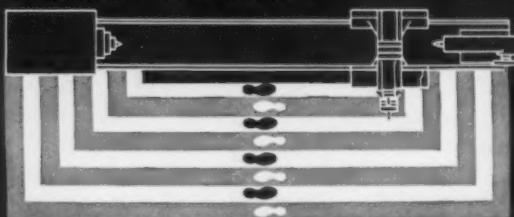
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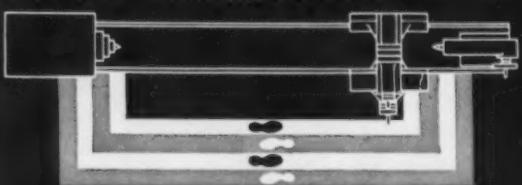
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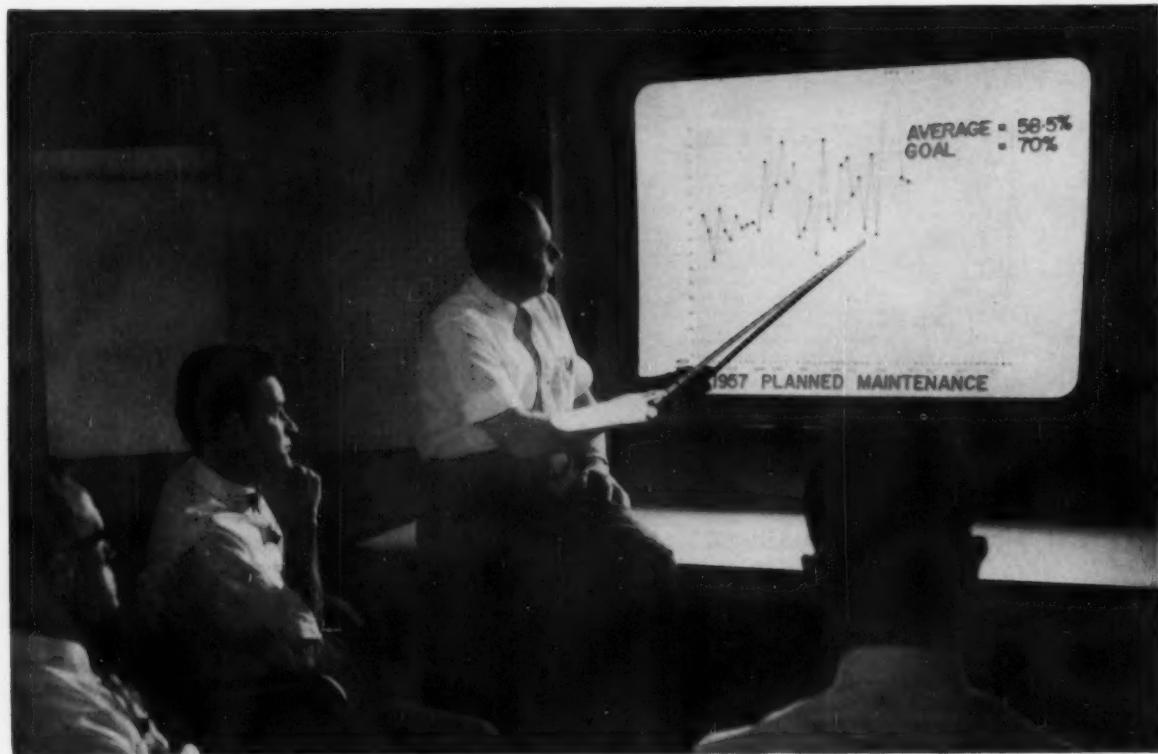


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TIME FOR PREVENTION: Better planning allows GE staff to spend more time on preventive servicing.

Reduce Costs and Boost Profits With Planned Maintenance

Too often management regards repair expense as only a necessary evil.

But maintenance pre-planning can cut plant downtime and lower operating costs.

Sound judgment required to determine equipment needing production insurance.—By P. J. Cathey.

■ Maintenance crews were developing king-sized headaches in the Small AC Motor Dept. of General Electric Co. several years ago.

Factory recommendations that aluminum melting furnaces be serviced every six months were leading nowhere. In two cases the furnaces taken off production looked in A-1 shape. Others broke down before the date of scheduled overhaul. One burned through the side, dumping molten metal on the shop floor.

Program Instituted — The troubles halted, however, when the department began a program of planned maintenance. A performance chart was established for each furnace. Port size, showing the

amount of aluminum build-up, is checked twice on the first working shift and once on the second. When build-up reaches a pre-determined level, a furnace is pulled off the line for overhaul.

In addition, furnace operating charts are constantly checked for any irregularities; instrument panels and electrical leads are thoroughly inspected; and alarm systems warning of power failure are equipped with duplicate sets of controls.

Operating Costs Slashed — The result: Furnace maintenance costs dropped 77 pct in a year, falling



SERVICE SUMMONS: Radio paging system speeds maintenance in Small Motor Dept. at General Electric.



DIRECT CONTACT: Maintenance specialist, wherever he is located, gets message on portable receiver.

from \$6700 to only \$1500. One furnace ran for 31 months without a changeout, another for 36 months. Downtime for furnace replacement was also pared. Changeover can now be completed in 40 minutes compared with a former day and a half.

Planned maintenance helped cut operating expenses in other areas of the plant as well. Punch press costs declined \$4000 in a year. Lathe expense was reduced by \$9000.

Departmental downtime decreased by 31 pct between 1956 and 1957. This year it is running 60 pct below last year's totals. With less time needed for emergency repairs, maintenance crews are spending more hours on preventive maintenance. Time put in on precautionary servicing rose from 35 pct of work hours in 1956, to 58 pct last year, and 76 pct this year.

The Theory — J. E. Moncsko, maintenance supervisor for the Small AC Motor Dept., regards all this progress the result of careful planning. "You've got to have a reason for starting a program of preventive maintenance," he says. "We wanted to reduce our costs and downtime, budget our money more accurately, and measure our performance."

"But breakdown is a disease. Before you can cure it you've got to locate the cause. You do it by research, study, record keeping and analysis. Good measurement is the first step and it requires plenty of facts."

Elaborate Records Kept — As a result, Mr. Moncsko points out, all repair records in the Small Motor Dept. are fact-studded. Work is cleared through maintenance specialists responsible for budget control as well as purchase of tools and parts. Completed jobs are coded by numbers to identify: parts of machine needing attention, reason for the breakdown, action taken, what happened to discarded parts, and follow-up required (complete machine overhaul, change in inspection schedule, more investigation.)

This data is tabulated and run through an IBM machine. Resulting records give each machine's entire work history at a glance. A weekly "hit parade" is kept of the five worst offenders in terms of repair cost.

Thorough record keeping has paid dividends for another company sold on preventive maintenance, Republic Steel Corp. For example, a card index file was set-

up to simplify bearing replacement on mills in the firm's Cleveland Works. For each bearing there is an individual card listing dates of inspection, servicing, or replacement. Colored markers are used on the cards as a guide in scheduling bearing change. Under this system, mill downtime for bearing failure has been cut and bearing life lengthened.

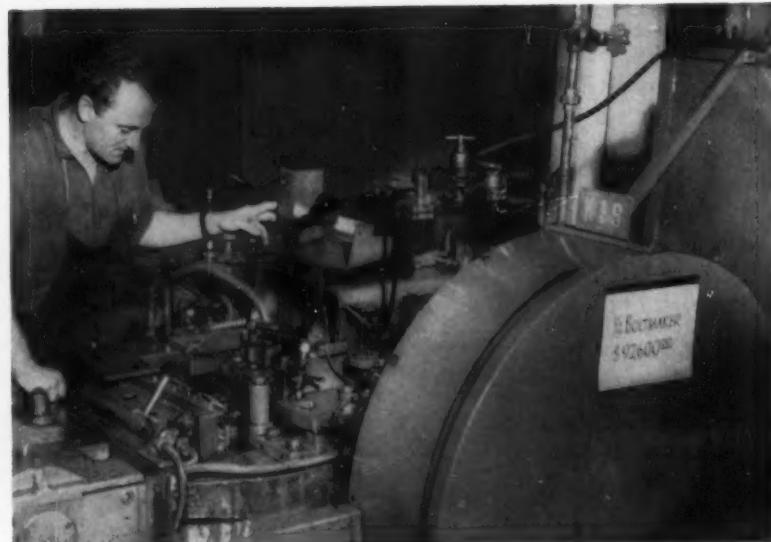
Training Important — Thoroughness is another area — employee training — also improves maintenance efficiency. How well a machine is operated and maintained depends on how well production men and mechanics know it.

But what's the best way to make sure men and machines are thoroughly introduced? Here's how it was done in the Small AC Motor Dept. at General Electric:

A maintenance specialist took pictures of plant equipment, combined them with diagrams in machine operating manuals, making a slide film presentation on each operating unit. The slides are shown at meetings of machine operators, foremen, electricians, time standards men, and maintenance personnel. Possible maintenance problems are outlined and thoroughly discussed.

Maintenance Plans Begin Early

How far back does maintenance planning go? Standard Pressed Steel starts it with machine selection. The firm buys the best-engineered tools available, puts price labels on them to encourage respectful handling. Additional units, ten machines for every eight operators, are held in reserve as standbys. All equipment is either replaced or completely rebuilt every 5-7 years.



Ready for Reference — These slides are kept on file. At any time they can be pulled out for review. With their help new employees are quickly brought up-to-date on any machine they may operate or service.

Machine operators at Standard Pressed Steel Co., Jenkintown, Pa., manufacturer of precision fasteners, are responsible for the maintenance of their own machines.

The company, believing quality control begins on the production line, carefully selects machine operators. They are given an initial "temperament analysis" test. This is followed by thorough training, including the proper use of indicating gages to keep tabs on machine operation.

Operator Knows — Each operator is able to tell when his machine is drifting off in accuracy, slowing down in output, or showing any abnormal behavior that might call for inspection or repair.

However, successful maintenance programs call for more than routine inspection, repair, and replacement. Pinpointing the plant areas which demand "critical maintenance" is all important.

C. E. Sutton, Jr., manager of marketing for GE's Service Shops

Dept., labels this the "real pay-off" of productive maintenance, calling for top engineering judgment.

Critical Areas — "All equipment must be analyzed for its importance to production," he says. "Where machine failure will stop or cripple output, you must provide insurance in the form of standby tools or parts. Backing up critical tools requires balancing downtime cost against the expense of stocking replacements.

"When critical production areas are determined, budget plans can be drawn up to include the needed stocks of spares. Overhauls are scheduled well ahead, remembering that critical equipment requires a more rigid system of inspection and service. Retiring or replacing of vital machines is carefully planned."

A Vital Factor — Too often, Mr. Sutton warns, management regards maintenance as a necessary evil. "Don't think of it as a separate expense item," he cautions. "It's as much a cost of production as are raw materials or labor."

On the question of "how much is enough" for maintenance he gives this illustration: A plant has a gross product of \$20 million a year and a profit of 10 pct or \$2 million. It spends 5 pct of the gross product

or \$1 million a year on maintenance. The maintenance engineer asks for an increase in his budget of 10 pct or \$100,000. Should management go along with him?

How Maintenance Profits — "Look at it this way," says Sutton. "Present maintenance costs \$5 a ton. If the extra money provides a 5 pct increase in output the maintenance cost per ton goes up from \$5 to \$5.50 a ton. But look what happens to net profit — It jumps from \$2 million to \$2,100,000. In other words, a 10 pct increase in maintenance cost will boost net income by 5 pct. Obviously the maintenance engineer deserves the extra money."

Management frequently has other blind spots about maintenance, according to Sutton. "In many firms," he says, "maintenance still consists of frequent lubrication, lots of inspection, sniffing for hot insulation, keeping fingers crossed, and hoping that if machines do fail it will happen when things are slow."

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Are Auto Price Tags Too High?

There May Be Other Reasons Behind Falling Sales

An economist looks at the auto market and comes up with an interesting analysis.

His conclusions are supported by Chevrolet and Ford's experience.—By H. R. Neal.

■ Some of the strongest criticism leveled at the automobile industry claims prices for the products are

too high. How important is price to the average car buyer?—possibly not as important as we have been led to believe.

"Prices are not the most important factor determining the market for new cars," according to a Univ. of Michigan economist, Assoc. Prof. Daniel B. Suits. He is codirector of U of M's Research Seminar in Quantitative Economics,

which uses mathematical techniques in the study of economics.

Why Sales See-Saw—Consumer income and the total number of cars already on the road have a much greater effect on automotive demand, he claims. New car sales, he says, depend largely "on a race between rising income, on the one hand, and a rising stock of cars on the road on the other."

"If, as at present, income does not rise sufficiently fast, the stock of new cars begins to catch up to the level consumers feel they can afford, and new car sales decline sharply."

Demand Level Drops—Prof. Suits said the industry "must be prepared to adjust to a somewhat lower level of new car demand." Figures developed by the seminar suggest that this level "will be somewhere in the neighborhood of four million cars for the present. But this will tend to increase about 250,000 cars per year upon recovery of our normal rate of growth in productivity and income," he said.

Five factors account for about 85 pct of the year-to-year fluctuation in car sales, according to seminar studies of new car sales from 1929 to the present. These factors are:

The average retail price of new cars.

The average price of other things consumers must buy (cost of living).

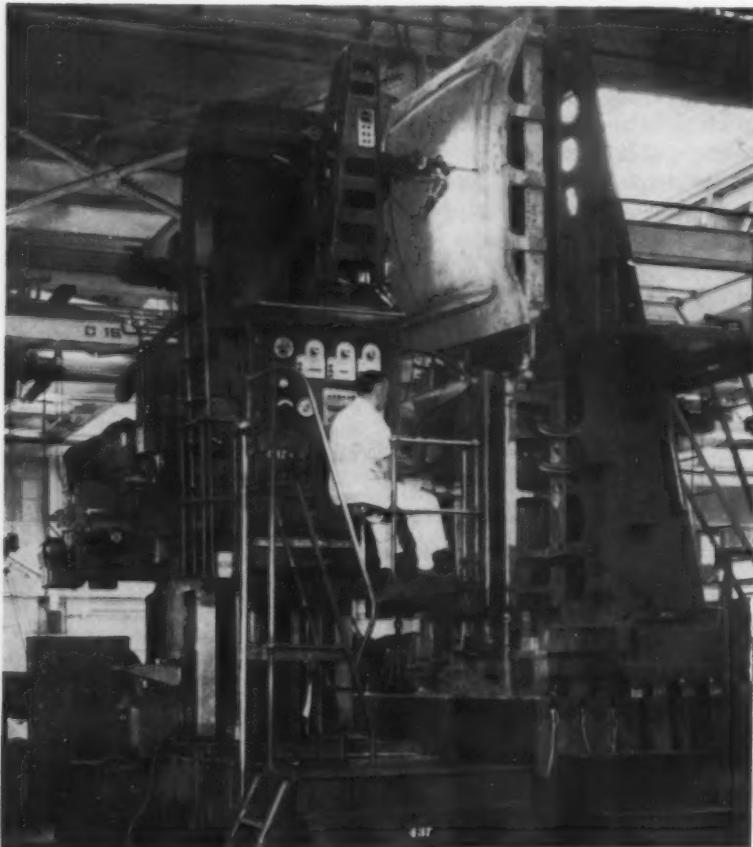
Stock of cars already on the road.

Incomes consumers have to spend.

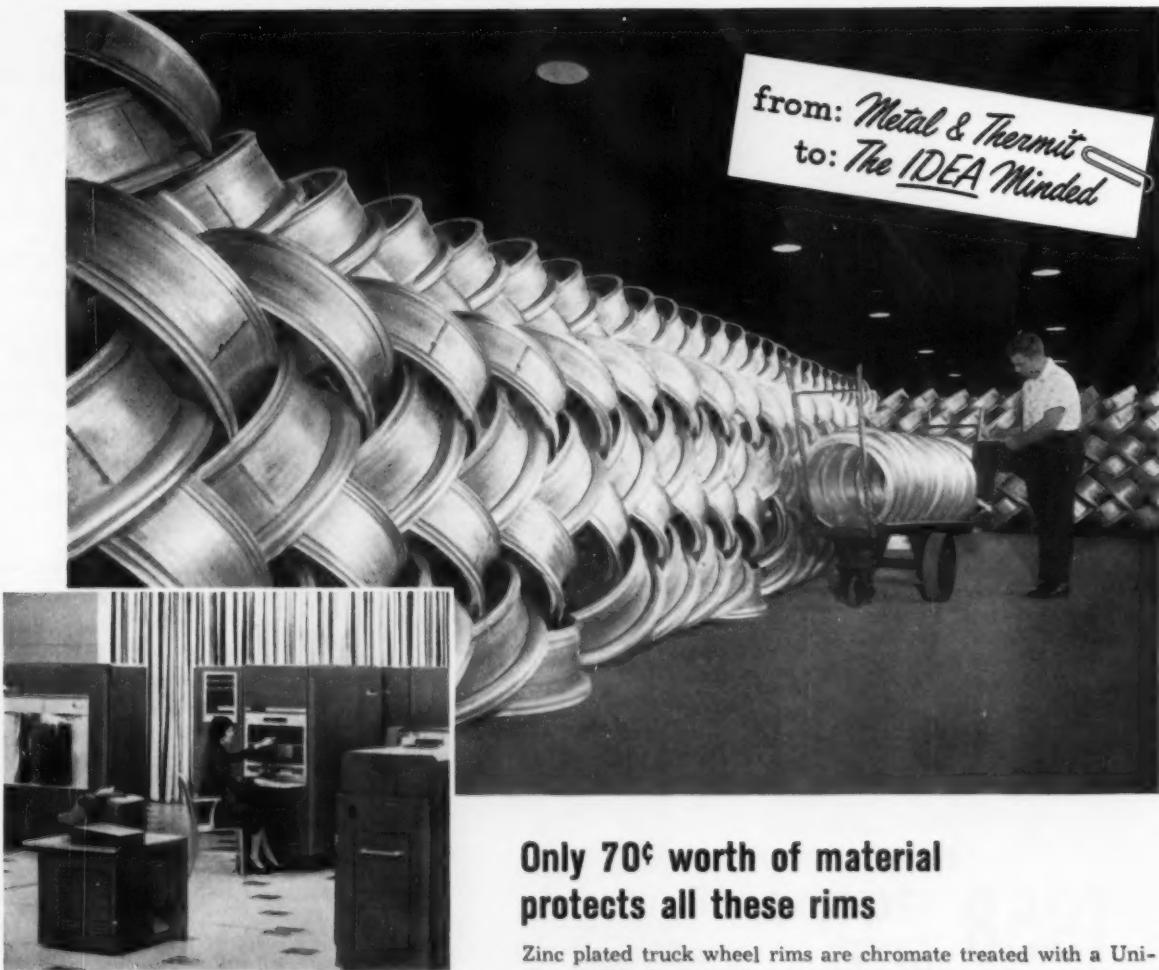
Credit terms for automotive buyers.

Two of these factors, retail cost

Getting Ready for the 1959 Edsel



A PEEK INSIDE: Breaking traditional secrecy, Ford Motor Co. allows a preview of a new die being made for the 1959 Edsel roof. A 97-ton electronically-guided cutting machine forms die out of solid steel slab



Dense copper deposit helps make a "brain" bright

Since a good memory is vital to computers, IBM plates memory cylinders with the Uni-chrome Pyrophosphate Copper Process. The deposit from this bath shows an exceptionally smooth, dense deposit of uniform structure.

For the same reason, electronics manufacturers use it in printed circuits. Metallurgists specify it for masking or "stop off" work in nitriding and carburizing operations, since it makes a more impervious shield with thinner deposits. Send for data on M&T's complete line of copper plating processes.



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THE IRON AGE, May 29, 1958

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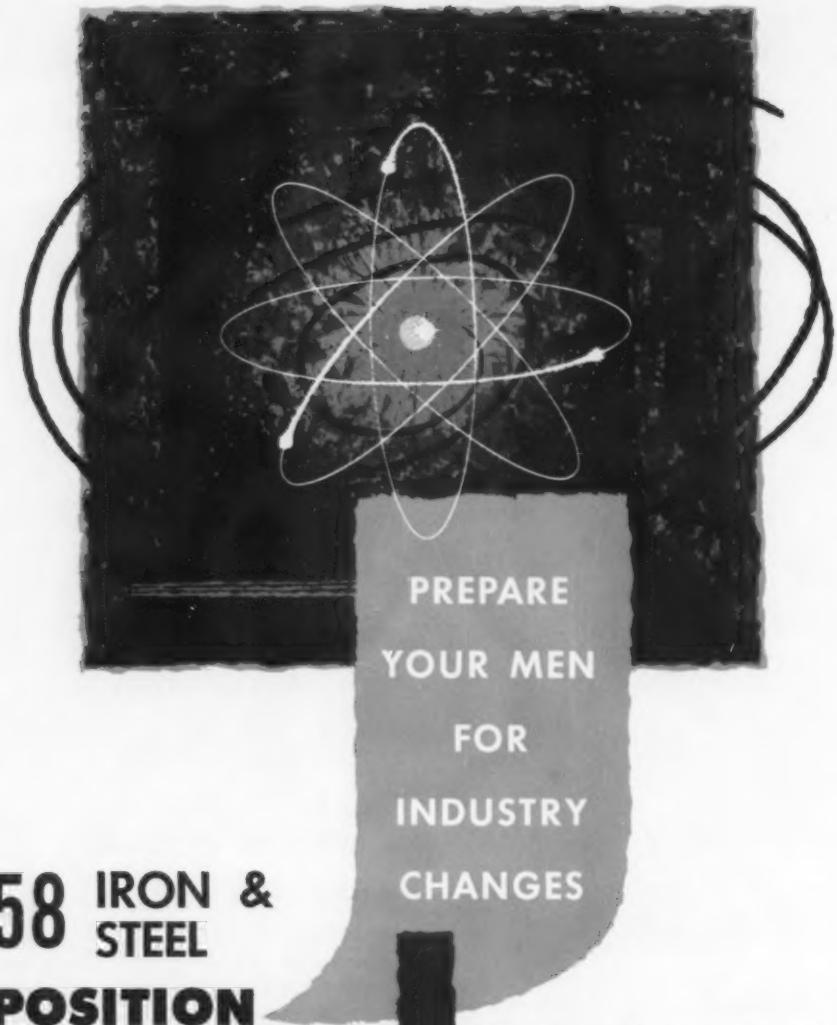
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THE IRON AGE, May 29, 1958

Automotive Production

WEEK ENDING	CARS	TRUCKS
May 24, 1958	86,032	18,143
May 17, 1958	87,407	16,755
May 25, 1957	127,428	23,407
May 18, 1957	127,390	23,123
TO DATE 1958	1,838,300	361,250
TO DATE 1957	2,791,200	467,900

*Preliminary

Source: Ward's Reports

of new cars and average length of payment for credit buyers, were combined by the seminar to get a cost per month for new cars. Prof. Suits believes this figure is "more meaningful to the average buyer" than price alone.

Income Is Sensitive—Historically, he says, changes in income have had about twice as much impact on the new car market as changes in the total number of cars on the road. Income fluctuates more rapidly than car stocks, he explains.

Changes in the cost per month of buying a new car are only about one fourth as important as changes in income, he concluded.

Seeming to back up the professor's conclusions that prices aren't everything with the auto buyers, are statements from two automobile executives.

Luxury Cars Popular—Chevrolet general manager Edward N. Cole says an analysis of the company's sales for the first quarter shows the Impala models, top of the Chevrolet line, accounted for more than 16 pct of sales.

"Furthermore, convertible, four-door station wagons, and Corvettes all showed sharp gains in percentage of total sales over the same period a year ago . . . more than 18 pct of our business during the period, compared with 15 pct a year ago," Mr. Cole says. Luxury lines, then, account for nearly a third of Chevrolet's sales.

The company's lowest price series, the Delray, only accounts for about 12 pct of the firm's sales.

Ford's Experience—Ford vice president Benson Ford says 61 pct

of current Ford automobile sales are accounted for by its middle priced Fairlane and station wagon series.

"The upgrading of the automobile and, correlative, of automobile prices, is largely the work of the consumer himself," Mr. Ford observes.

Detroit Briefs

Rambler Gains—American Motors Corp.'s Rambler continues to ramble along at a good clip. The firm reports May sales appear on their way to a new monthly record for the second consecutive month.

Sales in the first 10-day period of May totaled 4932 units. This compares with 4256 cars in the first 10 days of April, when the current monthly record of 15,418 units was set. In the same period last year Rambler sales totaled 3173 units and 8074 for the month of May.

First Chrysler School—Chrysler Corp. has opened its regional training center in Atlanta, Ga., first of

a series of such training sites throughout the country.

The center has facilities for training 6000 sales and service personnel annually. Approximately 2000 dealers, representing more than 25,000 employees and millions of sales and service customers in 10 southern states, will use the new training site, Chrysler said.

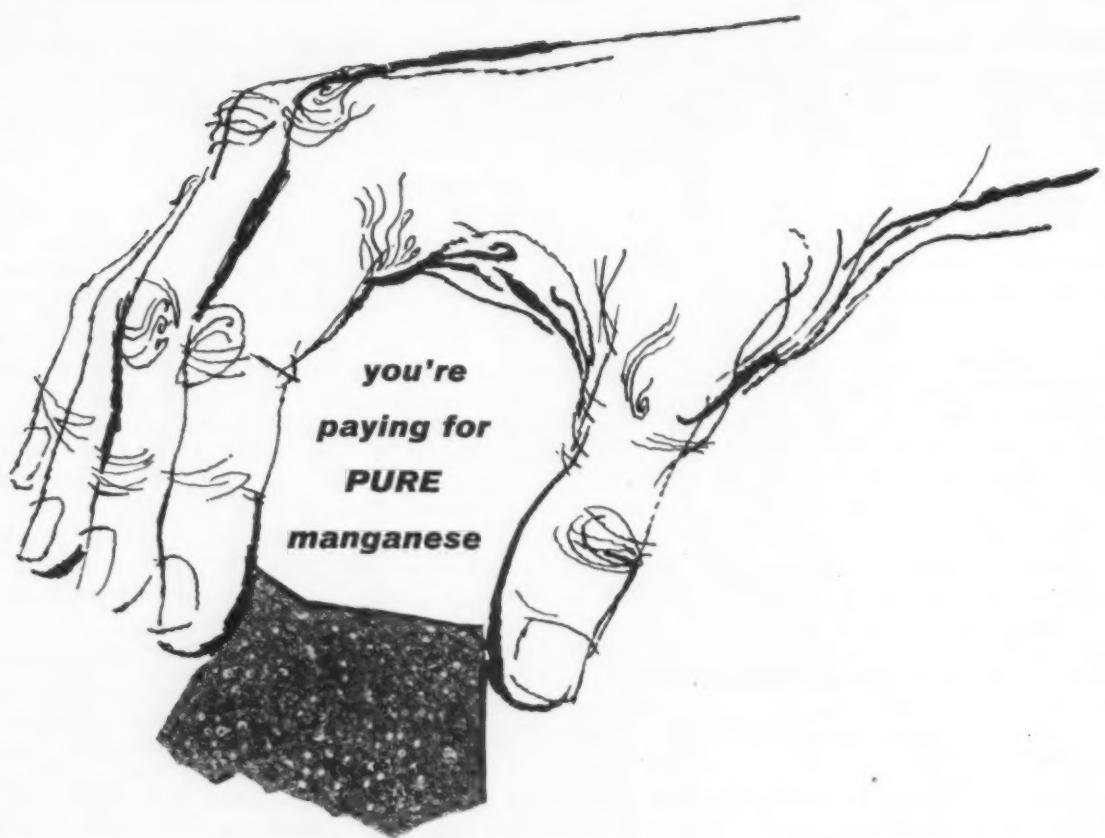
GM Employees Invest—Salaried employees participating in General Motors savings-stock purchase program invested more than \$48,112,000 during 1957, or a total of \$104,492,000 since the program began in late 1955.

Some 92,000 salaried employees in the U. S. and Canada are participating in the program—83 pct of those eligible.

S-P Fleet Report—Studebaker-Packard Corp. reports it has recent orders for 434 of its Econ-O-Miler taxicabs with 362 going into the city of New York. These last orders, S-P claims, have brought Studebaker to the No. 3 position in taxicab sales in the New York area.

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other steels where carbon and silicon control is critical.

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How Diplomats Hurt Foreign Aid

Staunch Foreign Aid Defenders Disillusioned

Anti-American outbursts are resulting in a new look at foreign aid programs.

Our own government people abroad have hurt U. S. prestige by failure to get close to the problem.—By G. H. Baker.

The case for foreign aid has been hurt badly by the anti-U. S. outbursts in Lebanon, Peru, Venezuela, Algeria, and France in recent days. Even the congressmen who used to be staunch defenders of foreign aid are now toning down their support.

At the State Dept., the policy planners have been greatly disillusioned by the abuse and insults hurled at the U. S. lately. Up to now, nearly all of them had operated on the theory that \$4 to \$8 billion, sprinkled around the world every year, would buy whole hosts of delighted and grateful friends all around the globe.

Friendship Not for Sale — But friendship cannot be bought, as any businessman knows. Respect and political amity can be won by sincere showing of good intentions and good works. Basketsful of cash delivered by amateur diplomats who look down their noses at the less-fortunate people of the world are received with hatred and contempt.

In southeast Asia, where the U. S. has spent hundreds of millions of dollars to win friends, the Communists continue to strengthen their position in the local government. Here's a typical reason why U. S. prestige continues to slide, while the Reds chalk up gains:

Locals Snubbed — Members of the American colonies (all government workers) in southeast Asian

metropolitan cities are almost never seen at local gatherings of businessmen, labor unions, or social events. They explain frankly that they prefer to attend the cocktail parties given by one another.

But the Russian agents, on the other hand, attend all meetings of business, labor, and culture. Their agents hang out in workingmen's bars. They are in constant contact with local school teachers. They go direct to businessmen with offers of new markets from the U. S. S. R.

Business Census Ready to Go

Federal census-takers expect to use about \$7 million in the next year to count U. S. business, manufacturing, and minerals companies.

Census Bureau has asked Congress for \$7.3 million to pay for the work immediately ahead. House

committee trimmed amounts by only \$300,000. Unless the cuts are extended considerably by Congress, the enumerating job will begin next January.

Preparations for this project—the 1958 census of business, manufactures and mineral industries—have been going on for two years. The census is to be completed in the 12-month period starting July 1, 1959. But Congress will be asked, next year, to provide another \$6 million.

More expensive will be the 1960 census of population. Census Bureau, using \$3.25 million now for preparatory work, asks for \$7 million to spend in the year beginning next July 1. Total cost of the census, however, is to be about \$110 million.

Buying of electronic data processing machines will be a large item in the coming-year outlays for the 1960 census.

Business Will Get Scant Tax Relief

Deadline Approaches — You will get an idea of the size and form of this year's tax bill soon. Deadline for enactment of some form of new Federal tax law is June 30.

Unless a new bill is on the books by then, the government's tax structure will be thrown out of balance by expiration of present rates on corporation income, tobacco, and liquor. Obviously, Congress can't let that happen.

The Problem — Basically, the problem facing tax-writing committees in the House and Senate is this:

How to maintain the necessary high rate of revenue and, on the

other hand, to legislate some selective relief for business areas that need it badly. As it stands now, the Treasury faces the discouraging prospect of running more than \$3 billion in the red this year.

The Possibilities — Here are some possibilities:

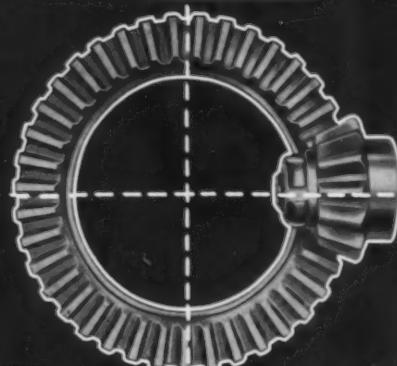
An end to the 3 pct Federal excise on freight shipments.

A reduction from 10 pct to 7 pct of the manufacturers' excise on new automobiles.

Some relief for buyers of used machinery.

Even lumped together these possibilities don't constitute a big break for business. But they may help.

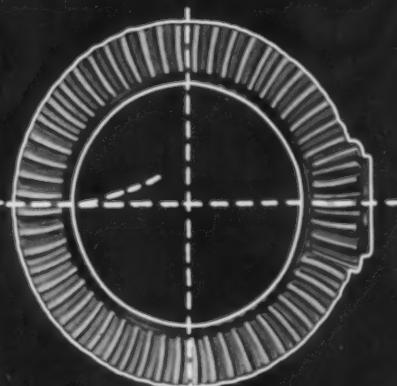
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Farwest Still Talks Expansion

But Many Small Firms Put Plans on Shelf

Heavy industry is going ahead with new expansion projects as scheduled.

Limited resources make small company plans more vulnerable.

—By R. R. Kay.

■ Most larger firms who had West Coast expansion plans in the works before the current slump started report that they haven't changed their minds. They still see "a tremendous growth in market potential based on facts and not speculation."

With the smaller companies, it's a different story. Many have revised plans to set up branches in the Farwest. Now they're concentrating on keeping their ship afloat in established markets.

Heavy Industry Interest—"Three or four large companies in particular are committed to do something in the next year," reports L. M. Holland, manager of San Francisco Chamber of Commerce's industrial department. These companies are in engineering equipment, chemical, and machinery fields, he says.

Talk of an integrated steel mill on the West Coast—dormant since business slid down from its peak—got a flicker of new life recently.

The subject came up in a report by the president of the Pacific Coast Co. The San Francisco-headquartered firm, in the coal mining business among others, recently bought the Wilkeson coal field, about 20 miles from tidewater in Puget Sound.

Blast Furnaces Expected—This field, Pacific's president, H. J. Jacks claims, "is the only known deposit

of good coking coal on the West Coast." The nearest other sources: Utah and New Mexico.

"We feel quite certain that blast furnaces will be built on the West Coast to supply the increasing amounts of steel that the growing population there will need," Mr. Jacks explains. He is convinced that the blast furnaces will be built in the San Francisco or Puget Sound area.

He Didn't Say No—Further evidence that expansion dreams don't die easily—they just go into hibernation—comes from U. S. Steel's board chairman, Roger M. Blough. At a press conference in San Francisco recently, Mr. Blough

had this to say about an integrated steel mill at Pittsburgh, Calif., where the Corporation holds an option on considerable land:

"You might assume we are interested in that area or we wouldn't have taken that option."

While he didn't say definitely that U. S. Steel would build blast furnaces there, he didn't deny it either. For the optimists, that's good news.

Tin Mill Improvement—Meanwhile, U. S. Steel's Columbia-Geneva Div. plant at Pittsburgh has been given the green light to spend some \$7 or \$8 million for more modern, lower cost, continuous annealing tinplate process.

Fast Handling for Nike Hercules

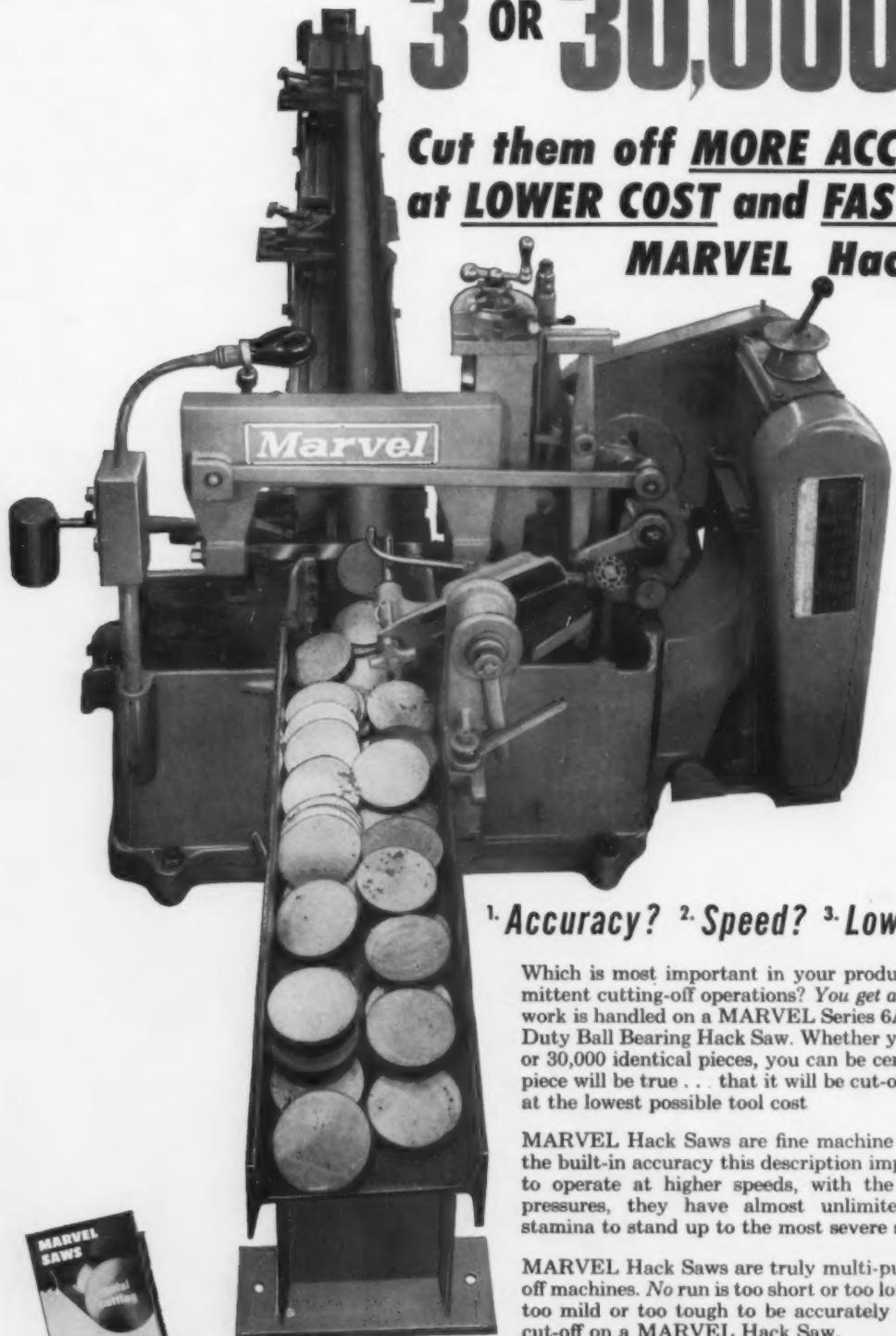


SPEED IS VITAL: New ground handling and launching equipment for Nike Hercules missile undergoes tests at West Coast proving ground. Equipment is produced by Consolidated Western Steel Div., U. S. Steel.

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Backlogs Sag to Post-War Low

Tool Builders See Little to Cheer About

For two years shipments of machine tools have been exceeding new orders.

Now backlogs have sunk to about two-and-a-half months.—

By E. J. Egan, Jr.

■ The recession is still squeezing the machine tool industry. Net new orders for metal cutting machines, as shown in chart below, added up to a paltry \$22.8 million in April. Net bookings of \$5.5 million for metal forming equipment only nudged the month's total to \$28.3 million for both types of tools.

What hurts builders is that the March flurry, in which the net new order total for both types hit \$35.4 million, wasn't sustained in April. And a look back to April, 1957, just brings on yells for more aspirin; they booked new orders for \$53.7 million's worth of metal cutting and forming tools in that month.

Lowest Backlog Yet—Tool shipments last month are estimated by the National Machine Tool Builders' Assn. to have been \$51.2 million for both basic types. That's not too bad compared to the March figure of \$53.6 million, but it's a long way below the April, 1957, total of \$110.7 million.

Inevitably, with shipments having outpaced new orders for the past two years, the industry's backlog is now only about 2.6 month's production at current rates. This is about as low as anyone can remember. It's even a little rougher for the makers of metal forming machinery. As a group, they have about 2.3 months of unfilled orders on hand.

Bullard's Forecast—The first-

quarter report of The Bullard Co. has this to say about the present situation: "Although the machine tool industry has experienced an increase in new orders since the first of the year, there is no evidence yet that this marks the beginning of a sustained upturn.

"Customer interest in our products continues to be strong with requests for quotations remaining at a fairly high level. It appears, however, that actual orders for new equipment are being held up pending more certain indications of general improvement in business."

Penman's Paralysis—Like The Bullard Co., most builders report

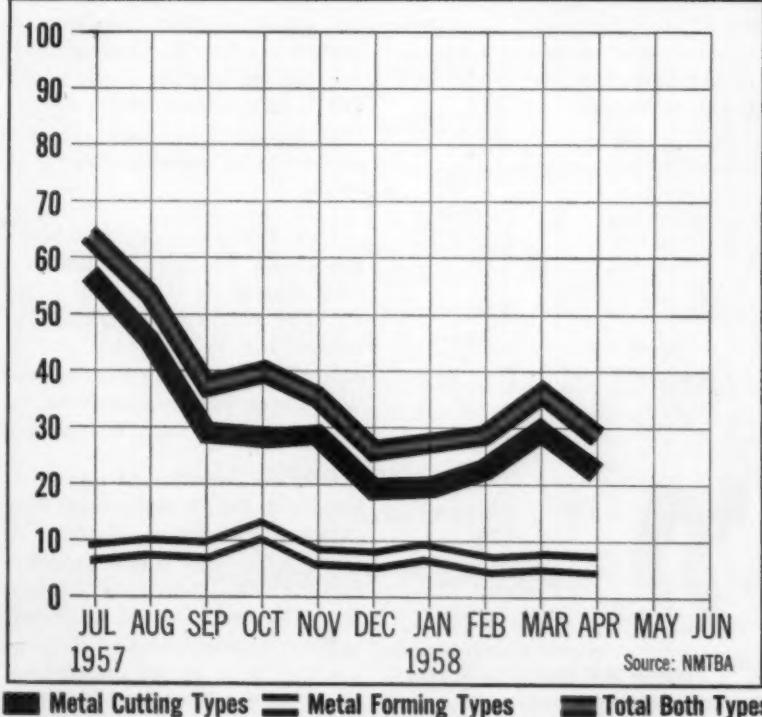
an encouraging number of inquiries about new machines and requests for quotations—in general, all the usual palavering that leads up to a signed order. It's just a case where most of the prospects get writer's cramp when they look at the dotted line.

Slowdown In Europe—American builders can take some small comfort from the fact that their overseas rivals are also beginning to feel pinched for new business. The British industry's order book at the end of April showed about nine months' work on hand at current production rates. West German builders are being hit, too.

MACHINE TOOLS-NET NEW ORDERS

In Millions of Dollars

Metal Cutting and Forming Types



Source: NMTBA

INDUSTRIAL BRIEFS

Don't Lose Your Diamonds—Reclaiming waste or used diamond is a new service being undertaken by the Abrasives Div. of the Elgin National Watch Co., Elgin, Ill. This service assures accurate assay of sludge for manufactures using diamond compounds and powders for lapping or diamond wheels for grinding.

No Slag Here—A new basic refractory material formulated especially for protecting the floor surfaces of marine and stationary boilers has been developed by Kaiser Chemicals Div. of Kaiser Aluminum & Chemical Corp. The material is called "Oceanite" and is designed to eliminate the costly and time-consuming pneumatic chipping methods usually required to break up slag for removal.

Fast Service—An electronic computer that can receive and process 5,000 orders daily for more than 25,000 different renewal parts will mean faster parts service for owners of Westinghouse appliances. Installed at the Westinghouse Renewal Parts Center, Newark, O., the new RAMAC IBM-305 Computer (random access method of accounting and control) is one of the first devices of its type.



"I suppose that means we'll have to start a trophy room!"

Guide to Alloys—Crucible Steel Co. of America has published The Crucible Alloy Warehouse Stock List which enables steel fabricators to determine easily and quickly the immediate availability of alloy steel stocks by grades and sizes. This publication is slated for reprinting every three months.

Ready for Orders—Pullman-Standard Car Mfg. Co. will start the second phase of a multi-million dollar expansion and improvement program at its Bessemer, Ala., freight car plant. It will cost more than \$1 million and is the eighth major improvement of production facilities there since the plant was opened in 1929.

For Ceramic Study—Three new ceramic fellowships have been established by the Lead Industries Assn., New York. One is in the College of Ceramics at Alfred University, another is in the Dept. of Ceramic Engineering at the University of Illinois, the third is at Pennsylvania State University.

All for Nickel—The Girdler Construction Div. of Chemetron Corp. will engineer and equip a hydrogen sulfide generating unit for Cuban American Nickel Co.'s nickel and cobalt producing facilities at Port Nickel, La. The hydrogen sulfide will be used to refine nickel and cobalt sulfides shipped from Moa Bay, Oriente, Cuba, for the production of metallic nickel and cobalt.

New Feeders—Two new Blaw-Knox ladle additions feeders have been ordered by U. S. Steel Corp. for Gary Works openhearts. The feeders will be used for making controlled additions of alloying materials, such as ferro-manganese, to the ladle rather than to the furnace.

Over the Border—Potter & Brumfield, Inc., manufacturing subsidiary of American Machine & Foundry Co., will open a Canadian manufacturing facility at Guelph, Ont. The company will be known as Potter & Brumfield, Canada Ltd., and will be a wholly owned subsidiary of the Princeton, Ind. firm.

Easy Terms—Reynolds Metals Co., Louisville, Ky., has created a new subsidiary, Reynolds Aluminum Acceptance Corp. New corporation will handle credit for purchase of Reynolds aluminum irrigation pipe and certain other non-aluminum components of irrigation systems.

Volume Up, Prices Down—Prices of many rare-earth oxides and salts were reduced 40 to 90 pct by Nuclear Corp. of America, Inc. Cuts were made possible by greatly increased volume stemming from the discovery of new applications for the compounds in the nuclear, metallurgical, petroleum, electronic, and other industries, the company stated.

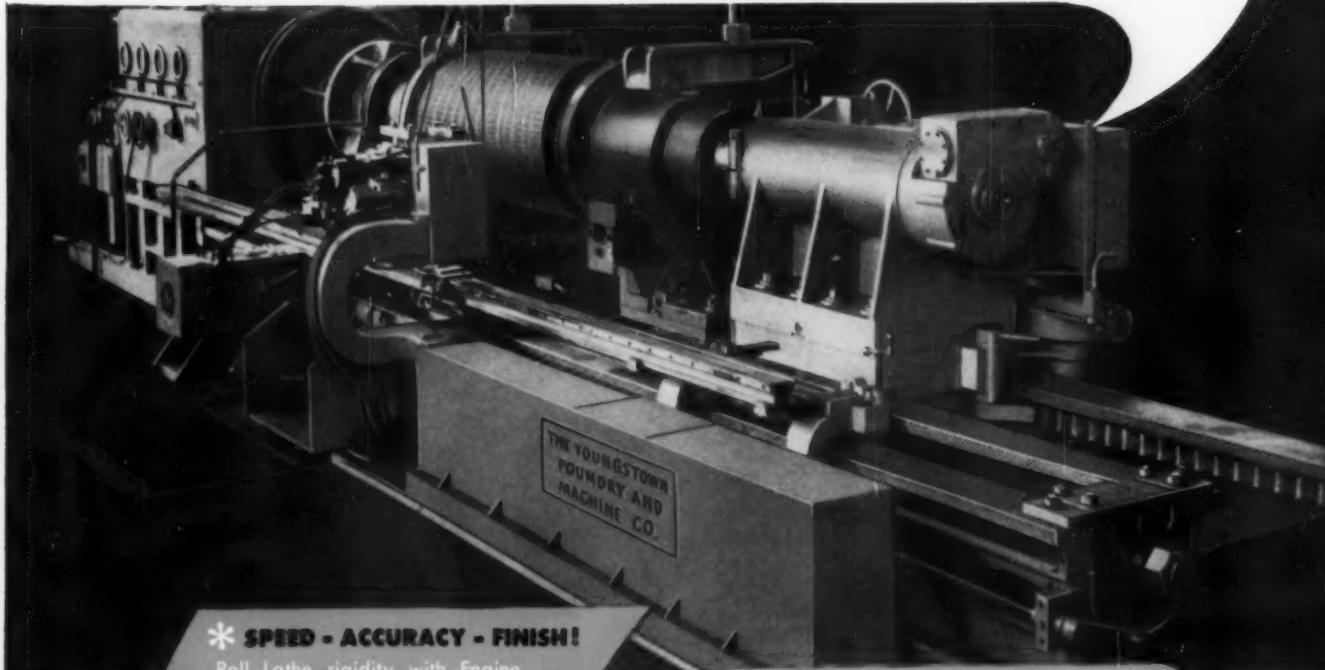
The Soft (Drink) Sell—U. S. Steel Corp. will undertake a major expansion of its advertising and product promotion program, primarily in newspapers, to stimulate sales of canned soft drinks during the summer months. Program will be supported by commercials on the U. S. Steel Hour and on a weekday news telecast, both on the Columbia Broadcasting System.

New Headquarters—The Chicago executive offices of Pullman-Standard Mfg. Co. will be located at 200 South Michigan Avenue, Chicago 4, Ill., as of May 26, 1958.

Sales Expansion—I-T-E Circuit Breaker Co., Philadelphia, has named four distributors to handle sales and service of its line of electro-magnetic clutches. Distributing firms are Willey-Wray Electric Co., Cincinnati, Jonco Tool Specialties, Rockford, Ill., Machinery Electrification, Inc., Northboro, Mass., and Lax Industrial Products Co., Cleveland.

Altered Brands—Low alumina silica roof brick manufactured at Christy Works, St. Louis, Mo., and Canon City, Colorado Works has been renamed by Refractories Div., H. K. Porter Co., Inc. Formerly marked HKP, St. Louis products will be branded LC-R, and Canon City products will be called LCC-R. First quality silica made in Colorado will be marked LC-C.

Now "tomorrow's design in today's "YOUNGSTOWN" Contour Roll Lathes *



* SPEED - ACCURACY - FINISH!

Roll Lathe rigidity with Engine Lathe flexibility

Capacities: 24" - 36" - 48" - 60"

* NEW HYDRAULIC TRACER

controlled automatically. Front mounted tracer and templet for operating ease and faster set-up

* NO FACEPLATE OVERHANG!

Faceplate supported by extra large Timken roller bearings mounted on extra-large torque hub to carry heavy radial and thrust loads

* NEW TOOL POST & CARRIAGE

designed for either single point carbide-tipped tools or regular roll turning tools

* RUGGED HEAD STOCK!

Herringbone gearing; automatic lubrication; illuminated inspection ports

*Turn rolls better and faster with
Automatic Tracer Control*

Far ahead in design and efficiency, this new roll lathe has been developed to turn rolls better and faster . . . either on necks or centers . . . from the smallest bar mill roll to the largest back-up roll. Tested and proved in our own roll shop. Capacities to meet your specific needs.

The 48" roll lathe pictured has a speed range of 1.40 RPM to 81.1 RPM. Roll capacities: 18" minimum diameter, 50" maximum diameter, with 20'0" maximum length. Hydraulic ragging attachment can be furnished, as illustrated. Tell us your requirements . . .

Write for Complete Information

The Youngstown Foundry & Machine Company

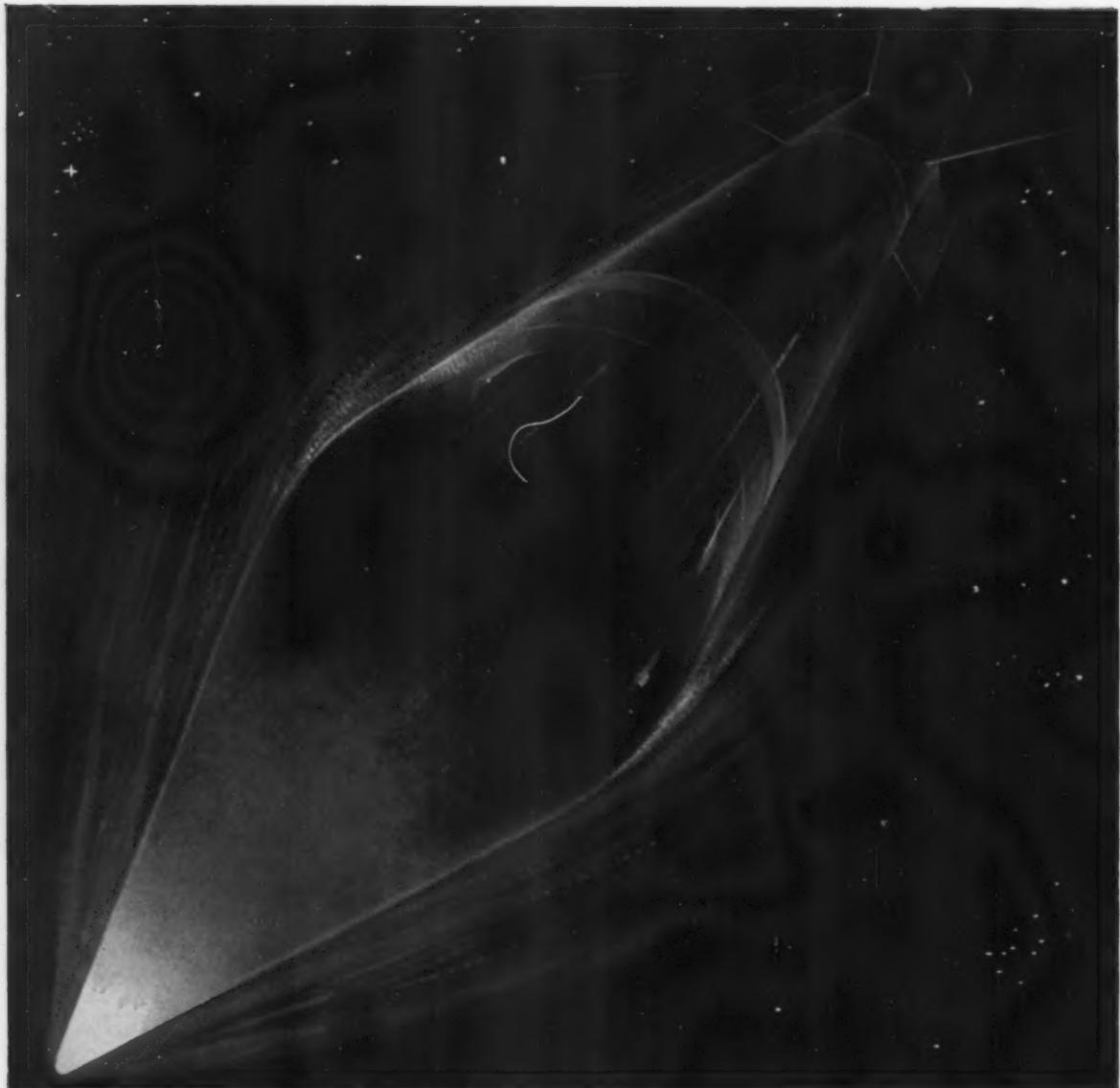
Serving Industry Since 1885

Youngstown 1, Ohio



HEAVY MACHINERY • AUXILIARY EQUIPMENT • CASTINGS • ROLLS

"YF&M" builds the best of them



Why it gets hot in there

Closely packed within the thin shell of a guided missile is a mass of electronic equipment. Crowded in so tightly, the tubes and other components scarcely have a chance to dissipate their own intense heat.

In addition, when the missile cuts the air at supersonic speeds, that thin shell builds up screaming heat—enough to wilt metal, to say nothing of the insulations that keep the electronic systems working.

Making electronic insulations that resist this murderous heat is one of the big projects going on today at CDF. A sixty-year reputation for highest-quality insulations makes CDF a major supplier

to the guided-missile field—where half of a multi-billion-dollar budget goes into electronic equipment.

CDF products serve not only the electronic industry but also the aircraft, automotive, communications, and railway fields—in fact, wherever quality mechanical and electrical parts are needed.

Your product may well be improved through the engineering co-operation of CDF experts. CDF sales engineers are always ready to help you make good equipment even better.



CONTINENTAL-DIAMOND FIBRE
A SUBSIDIARY OF THE *Bando* COMPANY • NEWARK 85, DEL.

R. O. Bass, elected president and general manager, Morse Chain Co., subsidiary of Borg-Warner Corp., Ithaca, N. Y.

M. H. Temple, appointed vice president and general manager, Richmond Plumbing Fixtures Div., Rheem Mfg. Co., New York.

R. W. Eiler and **A. R. Meyer**, elected vice presidents, The National Supply Co.

J. L. Kerins, appointed asst. vice president, industrial engineering, U. S. Steel Corp.; **F. B. Varner**, named general transportation manager, **N. C. Halleck**, named asst. general transportation manager.



W. A. Meddick, named president and general manager, The Elwell-Parker Electric Co., Cleveland.

R. J. Higley, named vice president, planning, Hupp Aviation Co., subsidiary of Hupp Corp., Chicago.

J. L. Adams, appointed director, sales, Owosso Div., Midland-Ross Corp., Owosso, Mich.

T. R. Adams, elected vice president, Eastern Operations, Detroit Steel Corp.

C. M. Stanton, named vice president and director, marketing, Controls Co. of America, Shiller Park, Ill.

W. E. Martin, and **P. B. Nolte**, appointed assistant treasurers, Wheeling Steel Corp., Wheeling, W. Va.



S. K. Towson, Jr., elected vice president and asst. general manager, Elwell-Parker Electric Co., Cleveland.

Dr. W. H. Duerig, appointed vice president, research and engineering, Midwestern Instruments, Inc., Chicago.

Michael Zajac, named vice president, engineering, Buhr Machine Tool Co., Ann Arbor, Mich.

R. T. Hood, becomes vice president and treasurer, The Gabriel Co., Cleveland; **T. A. Chervenak**, named controller.



F. J. Shanaberg, named manager, sales, Industrial Div. plant in Warren, O., American Welding & Mfg. Co.

MEN IN METALWORKING

M. H. Patterson, **R. W. Mueller** and **L. H. Fisher**, elected vice presidents, Minnesota Mining & Mfg. Co., St. Paul, Minn.; **H. F. Larson**, appointed asst. treasurer.



W. A. Neumann, Jr., elected president, The DeLaval Separator Co., Poughkeepsie, N. Y., and elected president, DeLaval Pacific Co., Millbrae, Calif.

H. R. Mantle, named assistant to the executive vice president, Dravo Corp., Pittsburgh.



Arthur Macfadyen, appointed chairman of the board and senior officer, Page-Hersey Tubes, Ltd.

W. G. Slack, appointed superintendent, Bar Finish and Inspec-

tion Dept., Crucible Steel Co. of America's Sanderson-Halcob Works, Syracuse, N. Y.; **J. G. Eckert**, named superintendent, conditioning and billet yard at the plant.

Nathaniel Cannistraro, appointed vice president, sales and marketing, Bettinger Corp., Waltham, Mass.

D. J. Wallace, named district sales manager, Duff-Norton Co., Pittsburgh.

M. A. Cordovi, joined the staff, Atomic Power Developments Section, Development and Research Div., The International Nickel Co., Inc.

P. S. Powell, promoted asst. contracting manager, Cleveland office, American Bridge Div., U. S. Steel Corp.; **A. S. Rogers**, named contracting manager, Trenton, N. J., office.



H. E. Markley, elected vice president, The Timken Roller Bearing Co., Canton, O.

J. H. Runyan, appointed manager, sales administration services, Carmet Div., Allegheny Ludlum Steel Corp., Pittsburgh.

Dr. Hans Leuenberger, named asst. administrative manager, technology, Electro Metallurgical Co., Niagara Falls, N. Y.

R. M. Staff, appointed works manager, Eastern Rolling Mills, Inc., New York.

J. A. Backstrom, appointed general manager, Palmer Tool & Forging Co., Meadville, Pa.

G. N. King, appointed supervisor, service metallurgy, structural, plate and high strength, U. S. Steel Corp., Chicago; **Alfred Hoagland**, appointed supervisor, service metallurgy, railroad materials and forgings.



R. L. Frederick, named asst. to the president, The Timken Roller Bearing Co., Canton, O.

R. E. Persohn, appointed general manager, Allis-Chalmers Gadsden (Ala.) Works.

R. E. Clay, appointed manager, automotive sales, Aluminum Div., Olin Mathieson Chemical Corp.

C. W. Oesterlein, named manager, Reynolds Metals Co.'s foil printing plant, St. Louis, Mo.

N. W. Landis, appointed manager, Northeast region, Allis-Chalmers Industries Group.



S. C. Howell, appointed manager, Northern Ore Mining District, Duluth, Minn., Republic Steel Corp.

A. D. Burke, named general sales manager, Specialty Products Dept., Westinghouse Electric Supply Co.'s Apparatus and Supply Div.

L. M. Kulze, promoted to factory manager, and **J. A. Harinek**, appointed chief engineer, Associated Spring Corp.'s Gibson Div., Chicago.



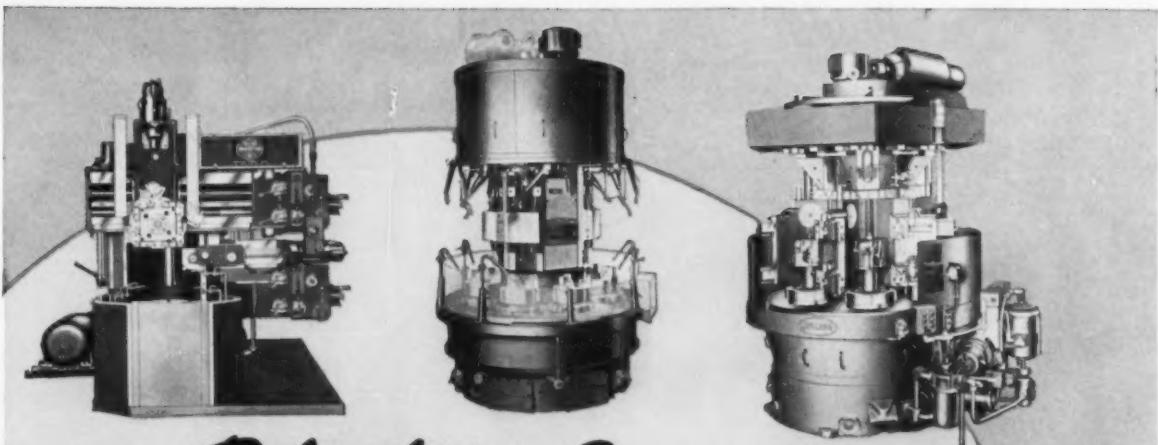
R. R. Hershey, named district manager, Cincinnati office, Steel & Tube Div., The Timken Roller Bearing Co.

D. W. Kaufmann, appointed manager, Titanium and Vacuum Metals Product Div., Crucible Steel Co. of America, Pittsburgh.



J. L. Chase, appointed Detroit district sales manager, Press Div., E. W. Bliss Co.

W. B. Manning, promoted to sales manager, Southeastern Div., and **Felder Wright**, to sales man-



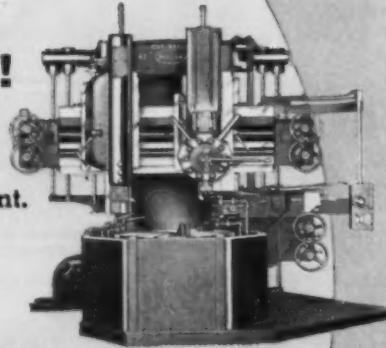
Rebuilding?

Yes Sir, We're Interested!

A Machine Rebuilding Program has been established which permits us to offer you excellent service on rebuilding your present Bullard equipment.

We believe that our facilities offer you many advantages including:

- 1 "Original manufacturers" know-how.
- 2 Genuine replacement parts.
- 3 Full year's guarantee on all parts replaced including labor costs.
- 4 All work done by factory-trained assembly personnel.

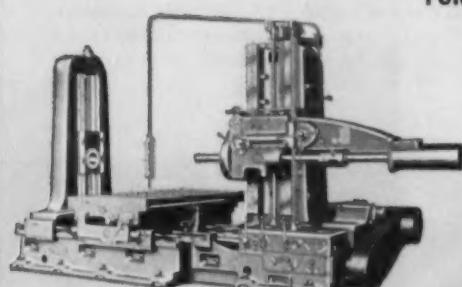
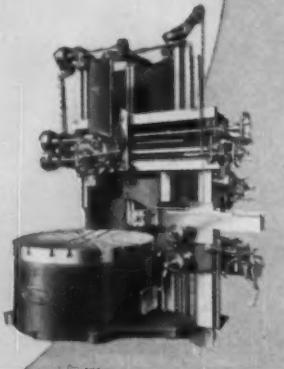


FOR YOU, THIS MEANS TOP VALUE
... DOLLAR FOR DOLLAR...
WHEN REBUILDING



MACHINE TOOLS

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT



we invite
your inquiries

USE THIS COUPON...

YOUR NAME _____ TITLE _____

COMPANY _____

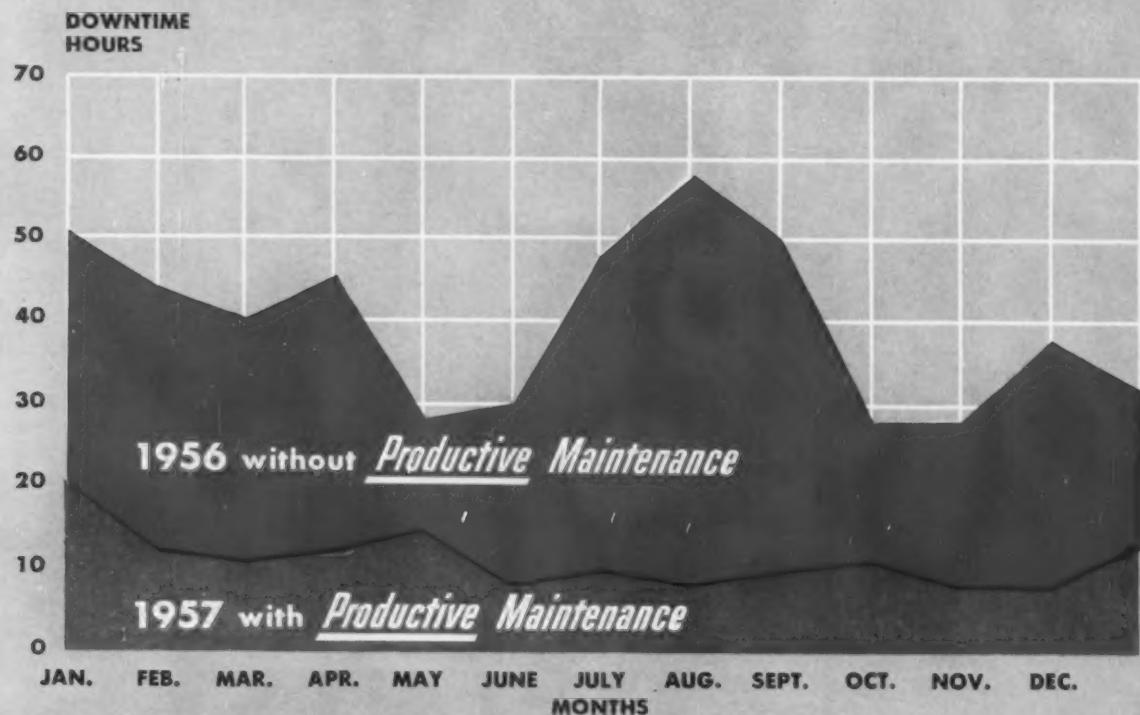
ADDRESS _____

CITY _____ STATE _____

Gentlemen: Please have your representative call to discuss the rebuilding of our

<input type="checkbox"/> Bullard Vertical Turret Lathe	<input type="checkbox"/> Horizontal Lathe
<input type="checkbox"/> Horizontal Boring Machine	<input type="checkbox"/> Spacer Table
<input type="checkbox"/> Multi-Au-Matic	<input type="checkbox"/> Contin-U-Matic

with Productive Maintenance in action...



◀ G-E MAINTENANCE SUPERVISOR, Jim Moncsko (right), integrates maintenance schedules with Small AC Motor Dept. manufacturing personnel.



WEEKLY MEETING of Department's maintenance staff encourages discussion of ways to improve maintenance procedures, areas for cost reductions, schedules, and renewal parts stocking.

Downtime Reduced 75% In One Year At Modern Factory

Since adopting a program of *Productive* Maintenance in 1957, General Electric's Small AC Motor Department, located in Schenectady, N. Y., effected a reduction of 75 per cent in production equipment downtime and further stabilized maintenance schedules by reducing occasions of emergency downtime.

Closely integrated with the manufacturing operation, "SAC's" *Productive* Maintenance Program immediately delivered outstanding benefits. During 1957, for example, *Productive* Maintenance practices applied to an aluminum furnace resulted in a saving of \$5,200. Additional cost improvements initiated by the maintenance operation saved the Department more than \$60,000.

Unscheduled downtime was further minimized by means of a parts stocking program for all critical

production equipment. More efficient utilization of trained manpower and machinery was achieved, repair parts inventories were stabilized, and unit production costs were reduced. Such measured performance receives the full cooperation of Department management, manufacturing, and engineering personnel.

You too can benefit by checking into the advantages of *Productive* Maintenance. Contact your nearest G-E Apparatus Sales Office, or G-E Service Shop for additional information. They will be glad to provide you with *Productive* Maintenance assistance. Also write for bulletins GEA-6087, 5-Steps to *Productive* Maintenance, and GED-3278, *Productive* Maintenance In Action, to Section 801-22, General Electric Company, Schenectady 5, New York.

Productive Maintenance—as vital as Production Itself!

GENERAL  **ELECTRIC**



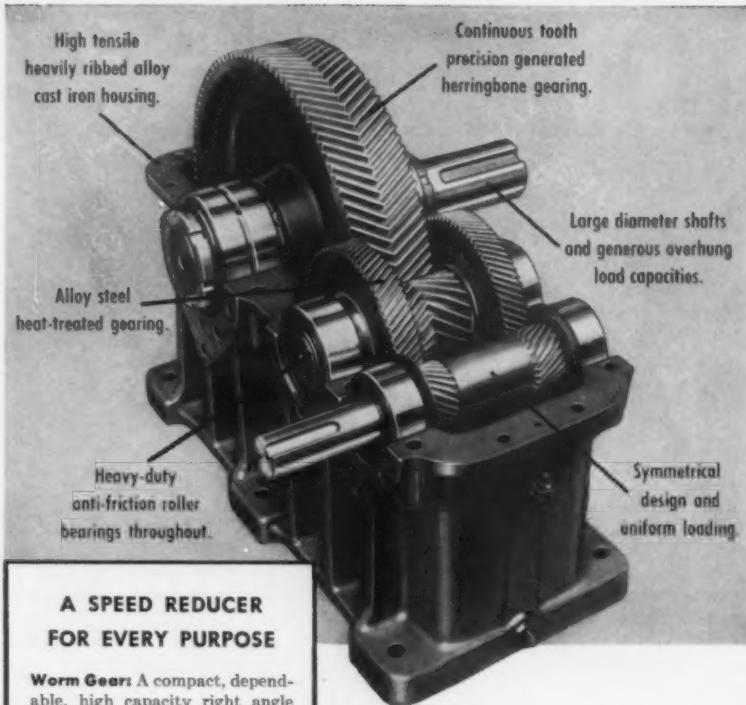
FLEXIBLE, EASY-TO-USE card index simplifies scheduling of routine maintenance. Every item of electrical and mechanical equipment is individually coded for visual identification.



RENEWAL PARTS STOCKING for only critical manufacturing apparatus, keeps spare parts inventory at minimum—reduces investment in non-essential spare parts.



OVERHAUL AND REPAIR of electric apparatus essential to the production process is planned and scheduled in advance with the local G-E Service Shop at Albany, N. Y.



**A SPEED REDUCER
FOR EVERY PURPOSE**

Worm Gear: A compact, dependable, high capacity right angle reducer available in a wide range of ratios.

Worm-Helicals: A high efficiency, rugged right angle drive for vertical output shaft applications. Ratios to 350:1.

Special Purpose: Years of enclosed gear drive design and manufacturing experience at your service.

ONLY Jones
GIVES YOU ALL
THESE QUALITY
FEATURES

And in the exact size for your needs! In fact, Jones Herringbone Gear Speed Reducers are available in 57 standard sizes, with capacities up to 1950 H.P., and a wide variety of ratios. Here's why they stand up in severe service:

Precision generated herringbone gearing of rugged heat-treated alloy steels gives toughness to carry heavier loads, provides smoother operation, and gives longer service life. *Anti-friction bearings*, conservatively selected, provide continuous accurate gear alignment and maximum efficiency from start to full load. *High test alloy iron housings* mean rigid protection for gears and bearings and prevent damaging deflection or distortion. *Splash lubrication system* keeps oil flowing to all rotating parts, insuring trouble-free duty. Shaft extensions and joints are effectively sealed to keep oil in and dirt out.

For information or service, contact your local H-R representative, or Hewitt-Robins, Stamford, Connecticut.



HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N.Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N.J. • Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

er, Southwestern Div., Lamson & Sessions Co.; J. W. Nall, named general sales manager, Chicago plant.



R. E. Kemelhor, named manager, future product planning and development, Pesco Products and Wooster Divisions, Borg-Warner Corp.

C. S. Volz, appointed credit manager, Cleveland credit office, American Steel & Wire Div., U. S. Steel Corp.

J. D. Hulser, appointed manager, marketing, Trion, Inc., McKees Rocks, Pa.

C. L. Altenburger, appointed technical assistant to the president, Great Lakes Steel Corp.

F. F. Wood, elected asst. to the vice president, publicity and advertising, The International Nickel Co. of Canada, Ltd., and asst. vice president, publicity and advertising, The International Nickel Co., Inc.

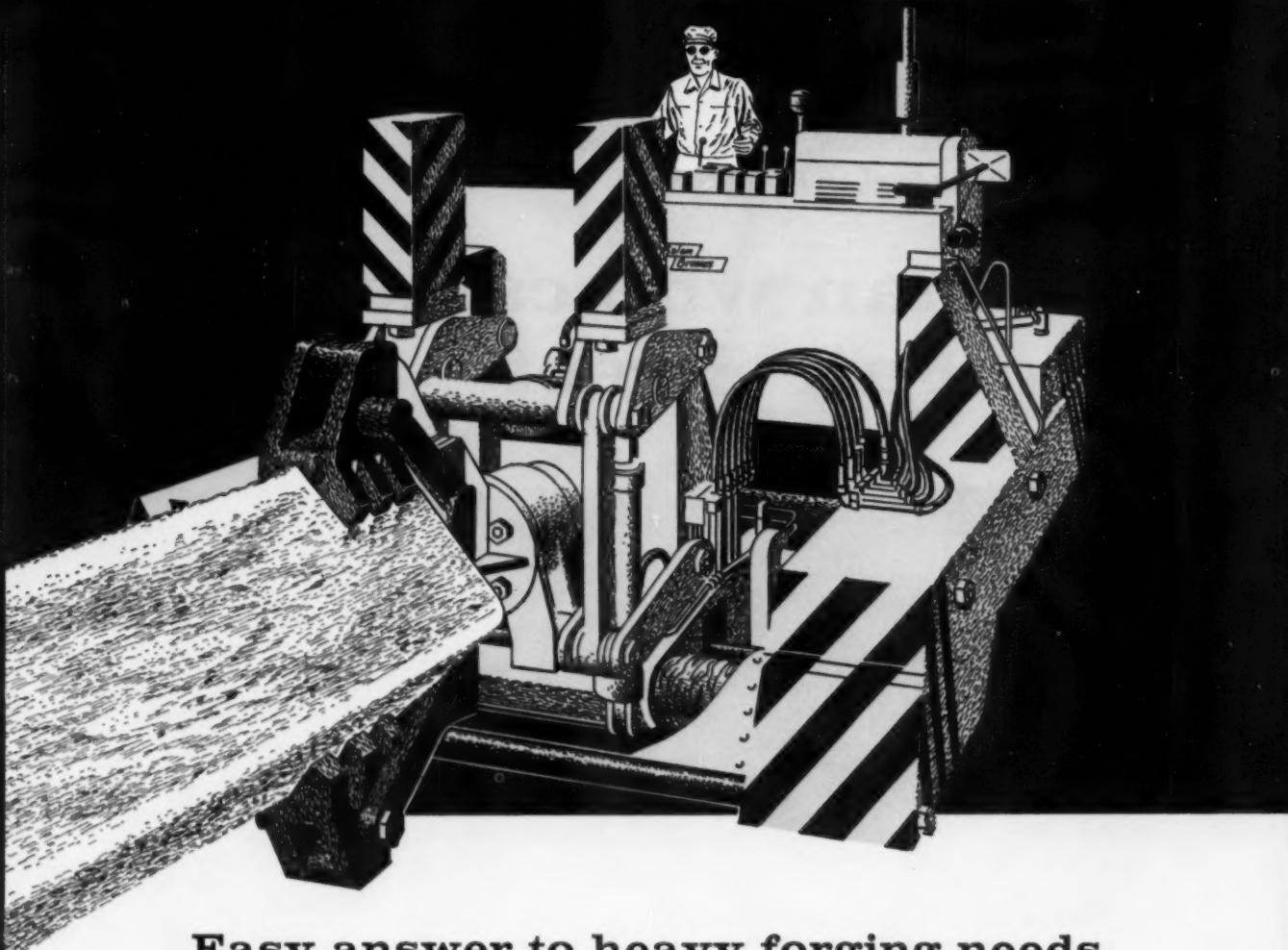
OBITUARIES

Walter Ferris, co-founder, vice president, consulting engineer, The Oilgear Co., Milwaukee.

H. C. Doss, 72, former executive, American Motors Corp. and Ford Motor Co.

C. L. Corban, 54, manager, coke production, Inland Steel Co.

R. J. Casterton, 43, district manager, New York office, Spang-Chalfant Div., The National Supply Co.



Easy answer to heavy forging needs

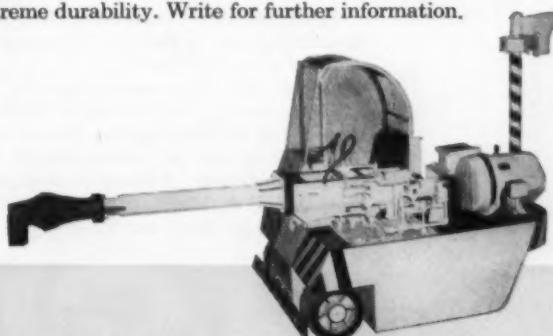
The free-moving Salem-Brosius rubber-tired manipulator adds speed, safety and economy to open-die forging. At hammer or press it raises, lowers, tilts, rotates or laterally moves the hot stock, satisfying forge manipulating requirements. Also, it can charge or draw forge shop furnaces, operating with the facility of a fork-lift truck in hot or cold stock handling. The Salem-Brosius Manipulator saves floor space. It travels to furnaces and presses or hammers

without freezing floor space with tracks or overhead areas with craneways.

This ruggedly-built machine meets the trend of industry toward hammer and press forging of high alloy, stainless and tool steels, and the many new extremely hard refractory-type alloys. The forging of these metals necessitates manipulating equipment of extreme durability. Write for further information.



Two other prominent members of the Salem-Brosius family of materials handling equipment are heavy-duty in-plant trailers (left) and the exclusive rubber-tired type furnace chargers shown at the right. Ask about them when you inquire about the manipulator.



SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited • 1525 Bloor Street West, Toronto 9, Ontario

SPECIAL MECHANICAL EQUIPMENT • INDUSTRIAL HEATING FURNACES • MATERIALS HANDLING EQUIPMENT

C. T. WEITZEL, President, Mechanical Specialties Co.
5700 West 96th Street, Los Angeles, California

a man who came to Fair Street



"We were skeptical of the claims for the JIGMIL Technique until we came to Fair Street. There we found the machine that met our need for accuracy and versatility with features to spare.

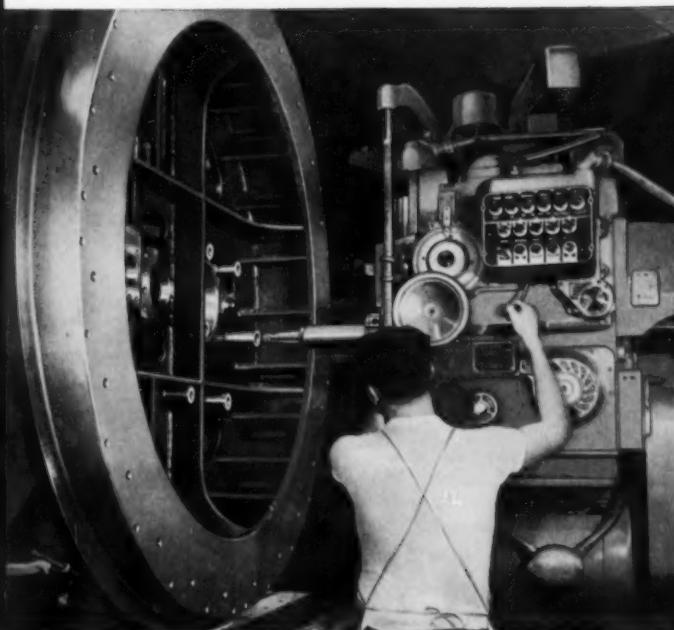
"As a contract manufacturer of tools, dies and precision components, we long felt the need for something new in the way of a precision boring and milling machine. Among other things, we wanted a machine having a configuration which would permit easy set-ups of a wide range of awkward and bulky work pieces. In 1946, we heard about the JIGMIL and the JIGMIL Technique of jigless boring. The claims for this machine were so unusual that we discounted much of what we heard, but decided that we should at least look into it. At Fair Street, we found the machine that met all our requirements with features to spare. Our first JIGMIL put us in a position to handle an entirely different class of work and without doubt, aided materially in our subsequent growth and development. Today, we have four JIGMILS which are consistently busy and consider them ideal job shop machines."

C. T. WEITZEL

DE VLIEG MACHINE COMPANY, 450 FAIR STREET

SOME OF OUR JIGMIL USERS

Airsearch Mfg. Co., Div. The Garrett Corp.
 Bell & Gossett Co.
 The Brush Beryllium Co.
 H. W. Butterworth & Sons Co.
 Byron Jackson Purposes, Inc.,
 a Subsidiary of Borg-Warner Corp.
 Cameron Iron Works, Inc.
 The Cleveland Pneumatic Tool Co.
 Delco-Remy Div. General Motors Corp.
 Eastern Air Lines, Inc.
 Euclid Div. GMC
 Fairchild Camera and Instrument Corporation
 General Atomic Div. General Dynamics Corp.
 Goodyear Aircraft Corp.
 C. L. Goulier Machine Co.
 Greenlee Bros. Co.
 Hoover Tool & Die Co.
 Hughes Aircraft Co.
 The Hydraulic Press Mfg. Co.
 I-T-E Circuit Breaker Co.
 Kaiser Industries Corp.
 Koppers Co., Inc.
 Kurt Mfg. Co.
 Librascope Incorporated
 Lycoming—Div. of Avco Manufacturing Corporation
 Manning, Maxwell & Moore, Inc.
 Massachusetts Institute of Technology
 Maytag Co.
 Menasco Mfg. Co.



A TYPICAL EXAMPLE OF JIGMIL PRECISION applied to the guided missile program

Mechanical Specialties Co. uses the JIGMIL Technique for machining pieces such as this 3500 lb. traversing-launching ring for guided missiles. Part is set-up on a Model 3B-96 JIGMIL. Critical machining involves boring 24 indexing holes on a 60" dia. with hole spacing of $\pm .0005$; an interior hole pattern of 5 holes coordinated to a master within $\pm .00025$; 30 additional holes in a 30" x 36" rectangular pattern to $\pm .001$; accurate milling of locating pads and boring of 3 large critical bores to $\pm .001$.

Our newest catalog
 will help you decide.
 May we send it?



FERNDALE • DETROIT 20

A FEW PROVEN ADVANTAGES OF THE JIGMIL TECHNIQUE

- Eliminates cost of expensive jigs and production delays resulting from their manufacture.
- Simplifies tooling.
- Employs automatic functions to reduce factors of human error even in close tolerance work.
- Makes possible greater flexibility of product design.
- Improves end product by permitting interchangeable assembly of parts without hand fitting.
- Increases production and product accuracy.

ACCURACY IS AN ECONOMY!

McKiernan-Terry Corporation
 National Cash Register Co.
 Norden-Kelty Corp.
 Robbins & Meyers, Inc.
 Rocketyne Div., North American Aviation, Inc.
 Rohr Aircraft Corp.
 AC Spark Plug Division, General Motors Corp.
 Sperry-Farragut Co., Division of Sperry Rand Corp.
 Stratos Div., Fairchild Engine & Airplane Corp.
 Sundstrand Machine Tool Co. (Aviation Div.)
 Sylvania Electric Products, Inc.
 Ulca-Bend Corp., a Subsidiary of
 Curtiss-Wright Corporation

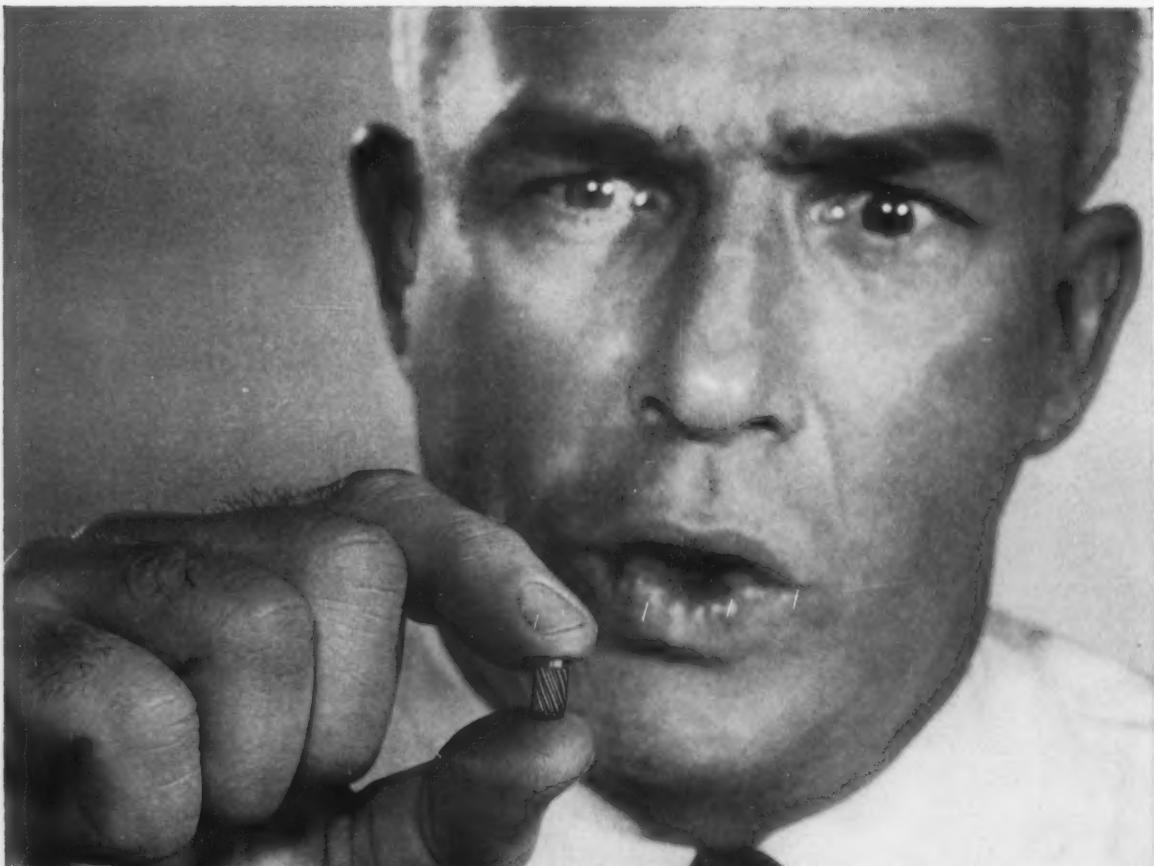
WILL YOU BE THE NEXT TO VISIT FAIR STREET



DeVlieg

**SPIRAMATIC
JIGMILS®**

ACCURATE HOLES AND FLAT SURFACES
 IN PRECISE LOCATIONS



"KNURLED?"

Don't blame you for doubting, but this is a fact. In fact, spelled out, this tiny part (and thousands like it, every day) is given a No. 20 coarse deep left-hand spiral knurl. And every one comes out clean as a whistle, as certified by Tyler Automatics Inc. of Thomaston, Connecticut.

This obviously is an unusually fussy job. But it was no tough problem for Bristol metallurgists who developed a free-cutting Brass rod of special chemical composition and temper. Then they followed through, and in two days they had this difficult alloy perfectly adjusted to the customer's shop practice and production schedules.

And Bristol Brass will follow through for you, too, on any job, no matter whether it's difficult or run-of-the-mill. But one thing you'll always find unusual . . . and that's Bristol Brass service. *Give it a try and see for yourself.*

Bristol-Fashion

means Brass at its best



THE BRISTOL BRASS CORPORATION • SINCE 1850, MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.

Cold Working

Moves into High-Output Uses

By D. J. Davis—Vice President of Mfg., Ford Motor Co., Dearborn

The idea of moving cold metal instead of removing it is growing fast.

It's proving a versatile, low-cost way to get high output on piston pins, tappets, all kinds of multi-diameter shafts and a host of other parts—as well as an effective method of forming splines.

Many of the functional and decorative parts of automobiles are formed by some type of cold working; sheet metal stamping and cold heading of bar stock are common practice. More recently, a lot of work has also been done on cold extrusion and rolling of metals.

Cold working was developed in Germany during World War II to improve the physical properties of low alloy and plain carbon steels for the manufacture of artillery shells. The materials saving made possible by the process gave added impetus to its development.

Cold forming of parts from bar stock generally consists of three steps.

In the first one a slug, or pre-form, is prepared by shearing or cutting a section of bar stock to the exact weight required. In the second step, the pre-form is coated, first with a phosphate solution, then with a lubricant to reduce friction during forming and prevent cold welding of the piece to the die.

The third step is the forming of the part itself, which may be a single hit or a series of hits. Sometimes it may be necessary to include anneal-

ing or softening in the forming sequence to get maximum formability.

Four Methods Evolve—In recent years, development work in this country has improved and added to early German extrusion techniques. Today, the four basic cold forming

methods shown in Fig. 1 are used.

The first method, backward extrusion, is used to form cup-like objects from a solid slug. The slug is enclosed in a die, and the moving punch causes it to extrude back along the punch.

The second method is forward extrusion; A cylindrical pre-form

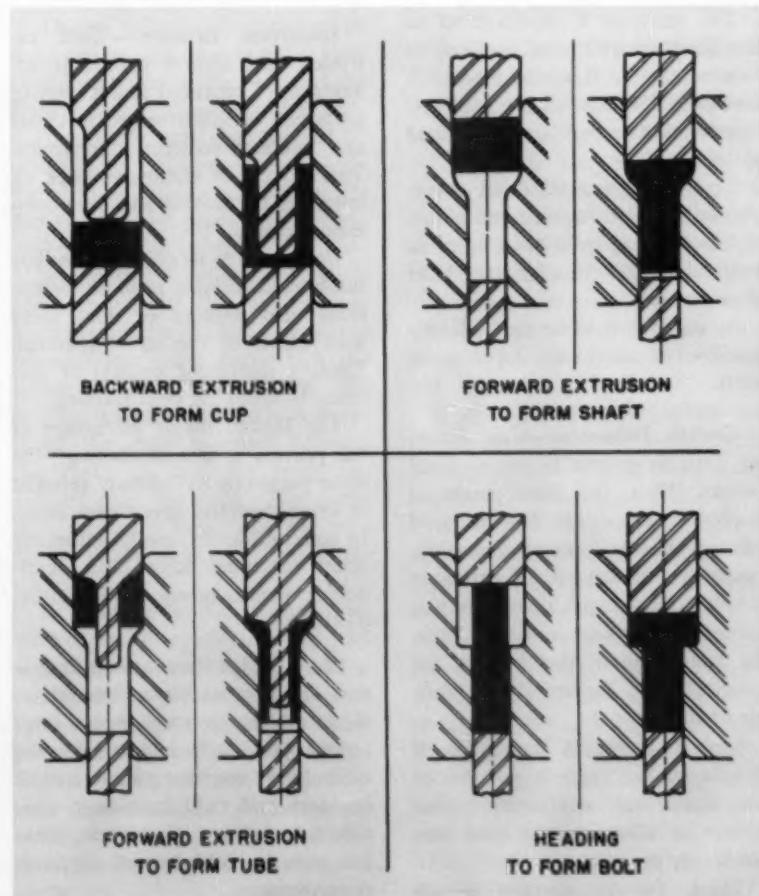


FIG. 1: Cold working has evolved into four basic methods which are used singly or in combination. It works to close tolerances and saves on metal.

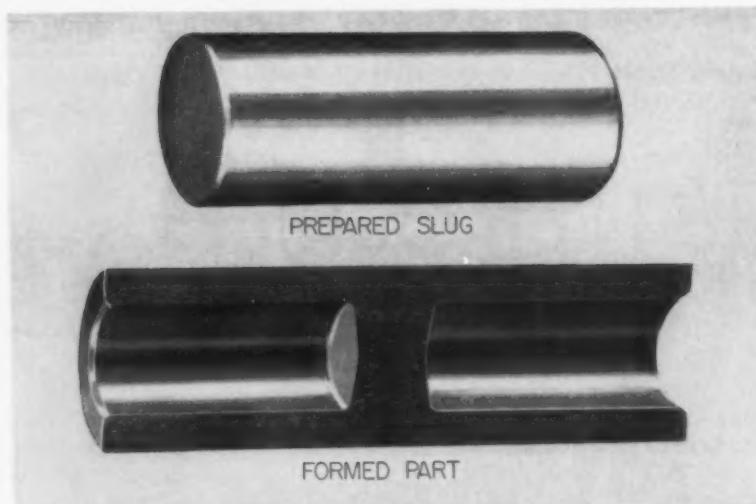


FIG. 2: Piston pin is backward-extruded at 120 psi pressure in a double-ended press which extrudes both ends of the pin at once.

is forced through a throated die to form a stepped shaft.

The third is a modification of the forward extrusion method to form a tube. In this case, the punch maintains an internal cavity. Stepped tubular parts can be formed by this method.

The fourth method is an extension of the cold heading technique, in which a rod or wire is upset in a closed die to form a flange or head at one end.

By combining these methods, it's possible to accurately form many parts.

Growth Influences—Cold forming owes its growth largely to three factors. First, the development of improved lubricants has reduced friction in the forming operation. Formerly, the amount of extrusion possible in a single operation was limited by life of the lubricant. Now, the metallurgy of the die and the material being formed is the limiting factor.

Second, increased knowledge of metallurgy has made it possible to cold work steel containing higher carbon or alloy content than was previously possible.

Third, the development of improved die materials and design has resulted in forming a greater variety

of shapes, and has contributed to the automation of cold forming.

Important Benefits—Cold extrusion has several important advantages. Compared to hot forging, parts can be cold formed to closer and more consistent dimensions. This reduces or eliminates stock allowances for scaling and decarburization losses.

Compared to machining from bar stock, cold forming to close dimensions also reduces or does away with much of the stock removal. Thus, a significant amount of material is saved by cold forming.

The second major advantage of the process is less machining. On some parts this has already resulted in lower facilities investment costs. In some instances, costly automatic screw machines have been eliminated. It also means lower cutting tool costs.

More Design Freedom—Elimination of some machining has an indirect advantage, too. Design limitations previously imposed by the difficulty in machining some critical contours and radii have been considerably reduced, since these areas can now be cold formed to finish dimensions.

Improved physical properties also result from cold forming. For ex-

ample, it produces better grain flow that doesn't outcrop into machine fillets and radii.

Cold forming can improve the strength of metal through cold working and hardening. Thus, for many parts, heat treatment may be eliminated.

Finally, cold forming produces a good surface finish, reducing the need for grinding or other expensive surface treatments.

Piston Pins Were First—The first Ford production use was cold forming a piston pin.

Four slugs, or pre-forms, are cut at the same time from bar stock to an exact weight. This is a critical step in the process. If the pre-form doesn't have enough material, the finished part will not be completely formed. If the pre-form is too large, it can break the dies. The weight tolerance allowed in forming the half-pound slug is only half a gram.

Next, baskets loaded with pre-forms are revolved through a phosphate solution, followed by a metallic soap to serve as a lubricant during forming.

A prepared slug after it is cut to length and coated with lubricant is shown in Fig. 2. The formed part below it is made in a double-ended press, which backward extrudes both ends of the pin at once.

Savings Add Up—This process is currently in use at two Ford plants. Over a period of three years, we have produced more than 20 million piston pins by the cold forming method.

Less than half a pound of material is needed now that the pin is cold formed, compared to almost three-fourths of a pound by the previous screw machine process. Since there are eight pins per engine, and annual production is two million engines, it means a saving of 2000 tons of steel on this single part.

Engine tappets are also being extruded in much the same way.

Besides the material economy, piston pins produced by the cold forming process have superior engineering features. In fatigue tests

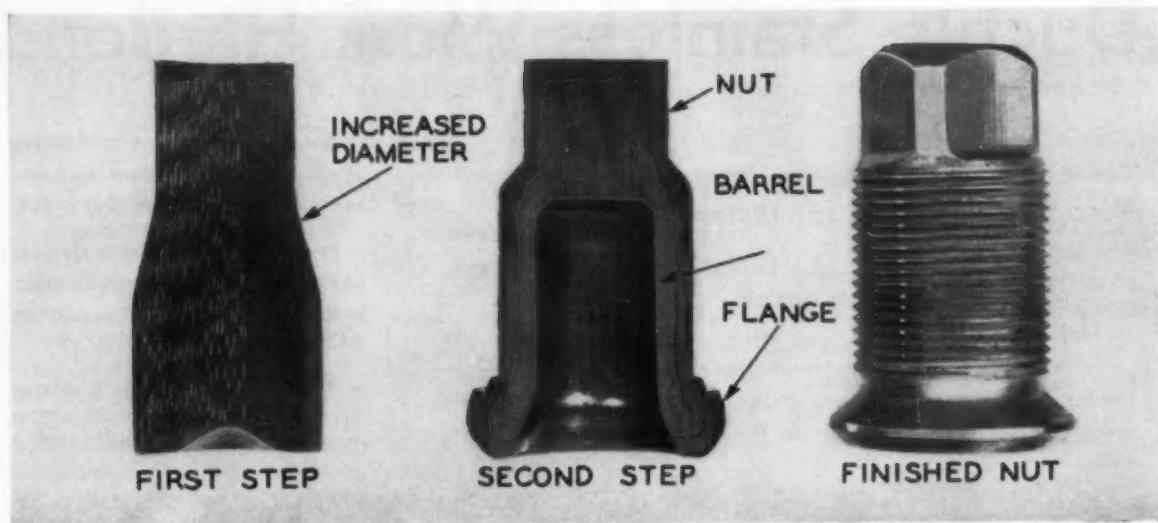


FIG. 3: Truck wheel nut—another high-production item—is cold-formed in a two-step extrusion process at Ford.

run on piston pins made by the two methods, the cold formed pin averaged over 51,000 cycles to failure; the machined pin averaged about 15,500.

Combines Two Methods—Another cold formed part now being made in production is a truck wheel nut, which is formed by a two-step extrusion process.

In the first step, Fig. 3, the pre-form is cold headed to increase the diameter of the blank at the extrusion end. Then it's extruded forward to form the nut, backward to form the barrel, and upset to form the flange. This job illustrates how parts may be formed by using various combinations of cold forming methods. Production of this part by the cold forming method eliminated a costly screw machine process and a milling operation on the square end of the nut.

Ford is also using cold forming to make tractor power take-off shafts in production quantities. Tensile strength, yield strength, and hardness are greatly increased by the process, and hardness is held between 286 and 321 Bhn without heat treating.

The tractor power take-off shaft is typical of a type of part widely used in automotive and related manufacturing. Therefore, the same

basic process can be applied to a number of other parts.

Also on Splines—Even the spline teeth can be cold formed rather than machined to finish the part. At the present time, splines on seven production shafts are being formed by cold rolling. This process, often referred to as chipless machining, began at Ford four years ago, and has now replaced hobbing.

In the spline rolling process, a shaft turned to the approximate pitch diameter of the spline is placed between two racks into which the spline form has been ground. By moving the racks in opposite directions, the shaft is rolled between the racks so that the teeth are pressed into the shaft. The metal thus displaced flows into the root spaces of the rack teeth and forms the spline.

In most cases the change from hobbing to rolling required that part specifications be changed from straight-sided to fine pitch involute splines. Shafts with the rolled involute spline have proved stronger. This is due to increased root diameter, better finish of the rolled spline, cold-working of the material surface, and the greater number of teeth.

Dimensional control is another advantage. Splines can be produced

to closer and more consistent tolerances by rolling than is generally possible by hobbing or shaping.

Lower Cost, Higher Output—Cold rolling also results in reduced tool grinding and down time, as well as lower facilities and tool costs per piece, due to higher productivity. On one of Ford's rear axle shafts, for example, an eight-spindle rotary hobber costing about \$100,000 will make 110 pieces per hour. The same part can be run on a single-station rolling machine, costing \$27,000, at a rate of 300 pieces per hour.

Thus, with a facilities investment of only about 25 pct of that required for hobbing, the rolling method will increase output almost 200 pct.

In some cases, spline rolling racks have produced one million pieces before grinding, compared to an average hob life of 3000 pieces. Furthermore, since metal is moved rather than removed during the rolling process, a saving in material is realized. Finally, cold rolling eliminates all chip handling.

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Ductile Stainless Work Hardens

Table 1 | Room-Temperature Properties of MicroMach and Type 301 (Extra-Full-Hard)

Steel	Direction of Test	Yield Strength, 0.2% Offset, psi	Ultimate Tensile Strength, psi	Elong., pct in 2 in.
AISI 301	Transverse	171,000	210,000	7.5
	Longitudinal	184,000	197,000	7.5
*MicroMach	Transverse	175,000	208,000	12
	Longitudinal	180,000	200,000	13

* Chemical Composition: C: 0.08-0.12 pct, Cr: 17-17.6 pct, Ni: 6-6.5 pct, N: 0.10-0.15 pct.

A new, nitrogen-containing stainless work hardens but has better ductility than Type 301.

Produced in sheet and strip, it has a wide range of application in the extra-full-hard condition.

■ A new stainless steel combines strength and ductility—especially in the extra-full-hard condition—that cannot be matched by conventional 17 pct Cr-7 pct Ni grades. Essentially a modified Type 301, the new high-strength steel is called MicroMach.

It was developed to meet the aircraft industry's ever increasing demands for higher strength structural materials. Development of the material was the joint effort of Washington Steel Corp., Jones & Laughlin Stainless Steel Div., and Battelle Memorial Institute.

Where It's Used—Some of the proposed applications for the material in aircraft and missiles include wing or skin surfaces, honeycomb skins or cover sheets, manifolds and piping system, the outside walls of thrust chambers, and nacelle areas.

Chemical composition and typical room-temperature tensile properties of the new steel in the extra-full-hard condition are shown in Table 1. Tensile values for Type 301 are also shown for comparison. Although the two materials are highly comparable in strength, the new alloy shows considerably higher ductility.

Add Nitrogen—That improved combinations of strength and ductility can be obtained in the 17 pct Cr-7 pct Ni steels by increasing carbon or lowering nickel content has been known for many years. But such modifications result in a steel with a rate of work hardening that reduces the latitude in the range of cold reductions at which an improved combination of

Table 2 | Influence of Cold Reduction on Tensile Properties of MicroMach and Type 301 (Transverse Direction)

Steel	Cold Reduction, pct	Yield Strength, 0.2% Offset, psi	Ultimate Tensile Strength, psi	Elongation, pct in 2 in.
301	25	120,000	162,000	22
MicroMach	25	123,000	157,000	27
301	30	134,000	175,000	18
MicroMach	30	135,000	168,000	23.5
301	35	148,000	185,000	14
MicroMach	35	148,000	178,000	20
301	40	154,000	195,000	11.5
MicroMach	40	157,000	168,000	17
301	45	165,000	205,000	9.5
MicroMach	45	167,000	188,000	14
301	50	171,000	210,000	7.5
MicroMach	50	175,000	209,000	12
301	55	182,000	220,000	7
MicroMach	55	180,000	220,000	10

For Extra Strength

strength and ductility can be obtained. This fact has discouraged marketing such steels.

Nitrogen additions, together with reductions in nickel content, provide exceptionally good combinations of strength and ductility over a wide range of cold reductions. It was on this basis that the new alloy was developed.

More Ductility—The new material work hardens in a manner similar to Type 301. But it shows better ductility at all levels of cold reduction (Table 2). Also, as supplied in the extra-full-hard condition, it has shown far more consistent properties than Type 301.

The elongation values of MicroMach, like 301, vary over a range so that both mill and users were faced with choosing guaranteed minimum values. For the extra-full-hard condition, this value was set at 6 pct minimum elongation in 2 in. and has proven a satisfactory specification.

Stress Relieving—The compressive properties of the new alloy in the extra-full-hard condition show a large difference between the longitudinal (117,500 psi) and transverse (218,000 psi) yield strengths. This is usually related to

the so-called "Bauschinger Effect" and is common to all cold-rolled stainless.

Stress relieving in the range of 600° to 900°F will reduce, but not eliminate, this difference. At the same time, stress relief will improve the compressive and tensile yield strengths about 10 pct with no significant effect on ductility.

For Bending—In the extra-full-hard condition, the new steel can be bent (with the axis of bend perpendicular to the direction of rolling) 180° around a pin diameter of 1.2 times the thickness without cracking. With the axis of bending parallel to the direction of rolling, limiting pin diameter is 5T.

These values indicate that the new material is quite formable in the longitudinal direction. In the transverse direction, generous bend radii are necessary.

Good Hot Strength—The new alloy maintains good strength at elevated temperatures.

It compares favorably with both semi-austenitic, precipitation hardenable stainless grades and heat-treated, martensitic stainless at 800° and 1000°F. Even at 1200°F, it has strength about equal

to that of the martensitic steels.

The new steel is not a substitute or alternate for the precipitation hardening grades. It is delivered to the user at the required high-strength level. Age hardenable steels are shipped in the soft condition and hardened at the customer's plant after the parts are formed. Age hardenable grades are formable in every respect, but the new alloy is restricted to mild forming and generous bend radii.

Welds Readily—In the extra-full-hard condition, the new alloy is slightly less magnetic than Type 301. It can be readily welded. However, welding heat causes recrystallization of the cold-worked structure and appreciable loss in strength. This is overcome in butt joints by spot welding backing strips over the butt joints.

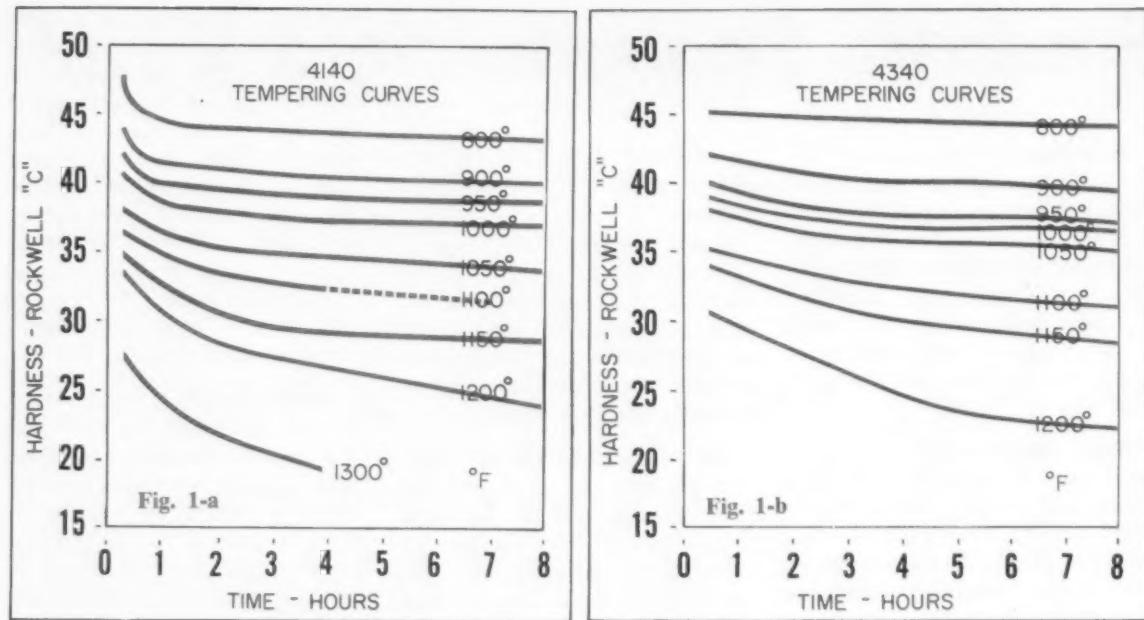
The new steel is supplied in sheet and strip form by the Washington Steel Corp., Washington, Pa. Sheet is available in widths up to 48 in., strip in widths slit to a minimum of $\frac{3}{4}$ in.

Sheets 48 in. wide are available in all thicknesses from a maximum of 0.075 in. to a minimum of 0.010 in. In 36 in. widths, the gage range is from 0.075 in. down to 0.005 in. Strip gages lighter than 0.005 in. are being explored. All sheets are furnished to extremely close tolerances, minimum crown, and smooth dense surfaces.

Table 3 | Range in Tensile Properties of MicroMach and Type 301 After 50 Pct Cold Reduction

Steel	Direction of Test	Yield Strength, 0.2% Offset, psi	Ultimate Tensile Strength, psi	Elongation, pct in 2 in.*	Hardness, Rockwell C
301	Longitudinal	163,000-207,000	191,000-215,000	4.5-13.0	43-45
MicroMach	Longitudinal	170,000-190,000	193,000-211,000	8.0-15.5	45-45.5
301	Transverse	155,000-182,000	202,000-216,000	6.0-10.0	43-45
MicroMach	Transverse	171,000-179,000	201,000-215,000	8.0-13.0	45-45.5

* MicroMach is guaranteed with a 6 per cent minimum elongation, although most heats are well above.



New Facts on the Nitriding Of 4140 and 4340

By A. J. Schwarzkopf—Project Engineer, Wright Aeronautical Div., Curtiss-Wright Corp., Wood-Ridge, N. J.

Here is a detailed report on the nitriding characteristics of two of the most popular high-strength steels—4140 and 4340.

New information on the relationship between core hardness and nitrided case hardness should be of real value to metallurgists, designers, and heat treaters.

■ Two widely used low-alloy, high-strength steels—4140 and 4340—can be satisfactorily nitrided in a single-stage nitriding cycle. In general, the maximum nitrided surface hardness will not exceed about Rc 58. If finish grinding is required,

final surface hardness can be expected to be somewhat lower.

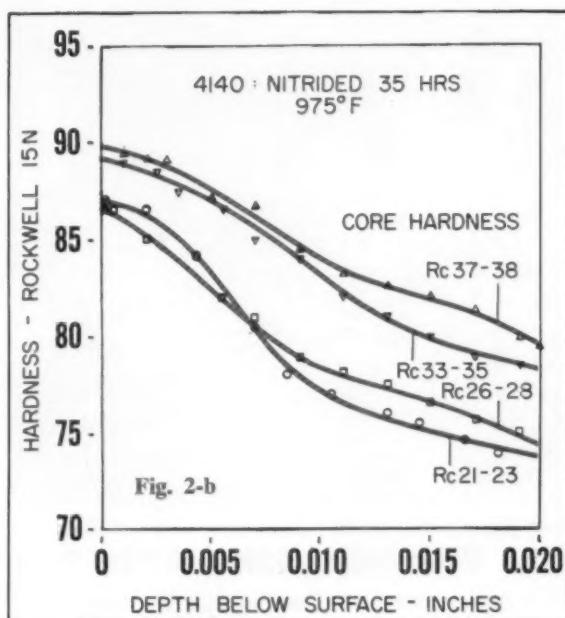
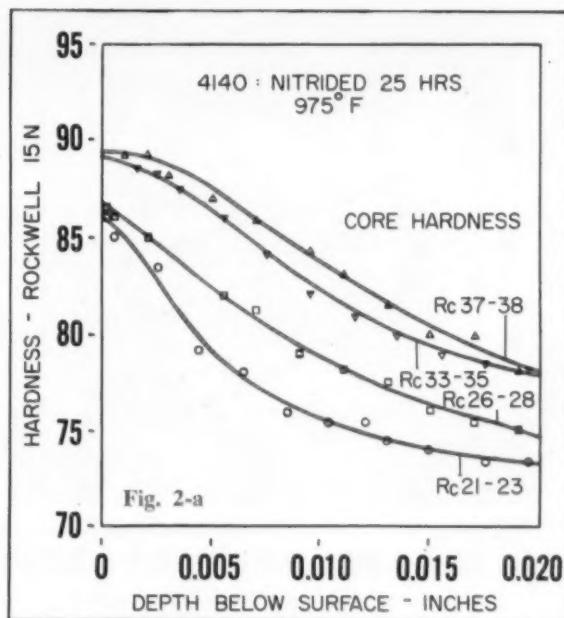
The nitriding of these steels appears to be commercially feasible. From an engineering and applications standpoint, maximum obtainable surface hardness may impose certain limitations depending upon end use. Significant, too, is the fact that the case hardnesses obtained are directly dependent upon the quenched-and-tempered core hardness of these steels prior to nitriding.

These results are of particular interest to those who would like to take advantage of the benefits of nitriding high-strength steels other than the grades specifically intended for nitriding. The results are the outcome of a test program con-

ducted by Wright Aeronautical Div., Curtiss-Wright Corp., Wood-Ridge, N. J.

List Advantages—The advantages of nitriding are well known. As a means for case-hardening steel for wear-resistance and improved anti-galling properties, the nitriding process ranks on a metallurgical par with the best techniques ever developed. In some instances, depending upon application, it is superior to other techniques. It can produce an extra-high case hardness with a minimum of distortion. Still, its use is not as widespread as carburizing, induction case-hardening, or hard chrome plating.

A major limitation of nitriding is that it cannot be satisfactorily ap-



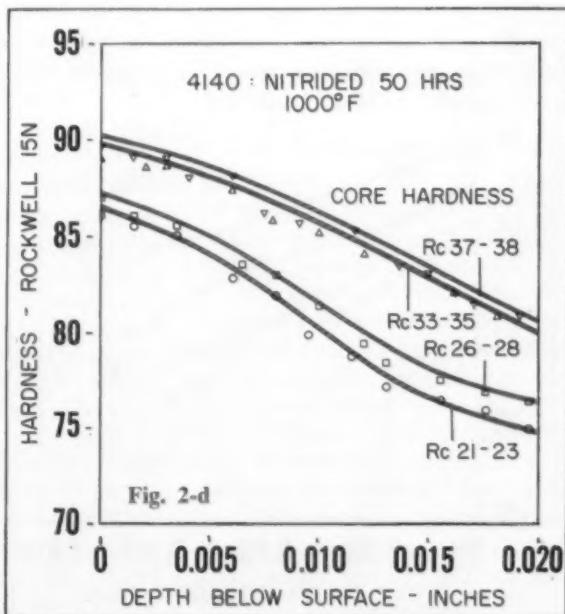
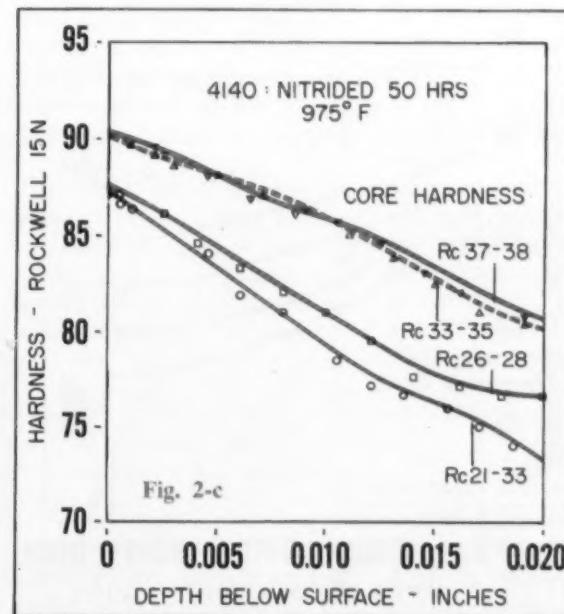
plied to many common steels. One reason for this restriction is that many steels, especially the plain-carbon grades, tend to build up an excessive layer of "white nitride." The layer is brittle, spalls readily, and has generally poor mechanical properties. A special series of aluminum-containing steels was developed to overcome this limitation, to restrict "white nitride" development to a minimum.

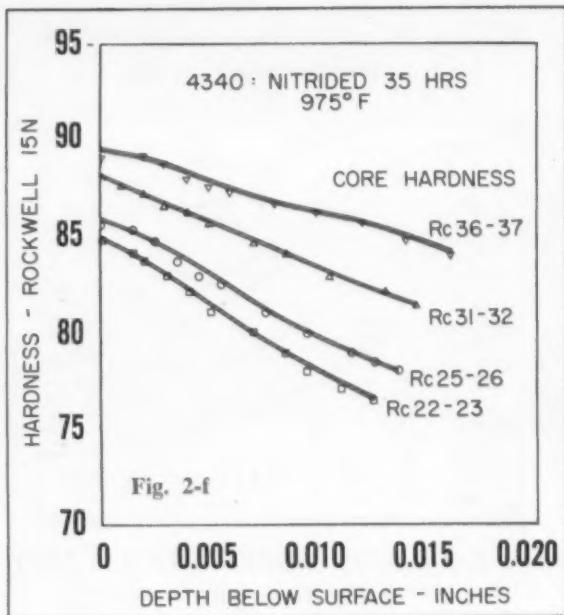
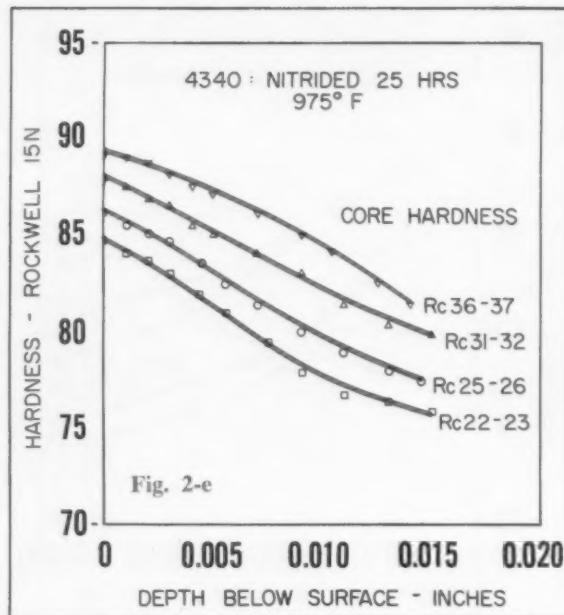
Broader Field—With the successful nitriding of two of the most popular constructional steels, 4140 and 4340, the field of application for the nitriding process might be considerably broadened.

The present development program began with a particular application in mind—the acceptable nitriding of oil pump gears made of either 4140 or 4340. But the information gained on the nitriding

characteristics of these materials should be of general usefulness to the metalworking industry.

One of the more significant findings was that 4340 can be nitrided to develop a case hardness equal to that obtainable with 4140. This is contrary to previous assumptions that tended to rate 4140 as the better prospect because of its slightly higher chromium and far lower nickel content. In terms of





alloy conservation, 4140 still holds a slight advantage.

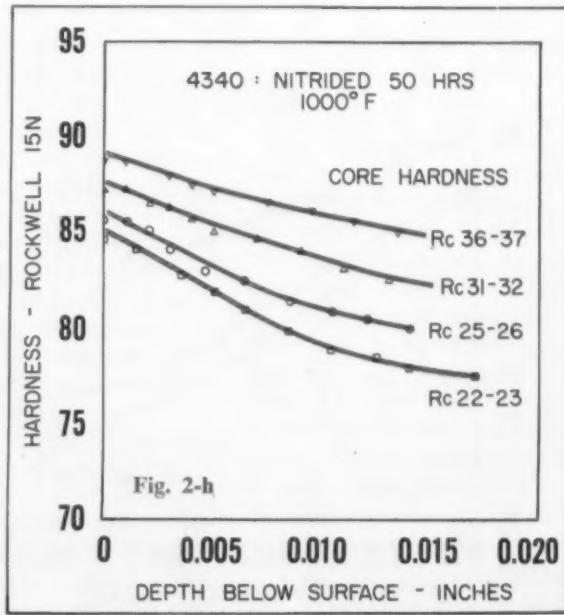
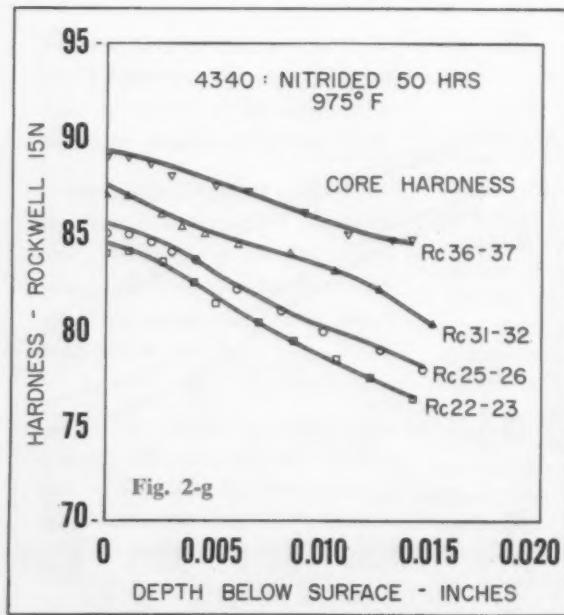
Tempering and Nitriding—Previous claims that 4140 provides a tougher nitrided case and is less subject to grinding cracks than aluminum-bearing steels were neither substantiated nor disproved as a result of the current test program. Emphasis was placed on determining nitriding characteristics rather than specific mechanical properties.

To check tempering characteristics and evaluate four different single-stage nitriding cycles, test samples were prepared from representative heats of both 4140 and 4340. Test specimens measuring 1.75 in. diam and 0.375 in. thick were machined from standard bar lengths.

Each specimen was checked in order to insure freedom from surface decarburization. These speci-

mens, in turn, were halved to produce two semi-circular sections. This provided a minimum of two samples for every test condition explored.

All samples were austenitized at 1560°-1575°F for 1½ hours and quenched in warm (150°F) oil. At least two samples were tempered at each of the temperatures, and for the times, necessary to produce the desired core hardness values. Tem-



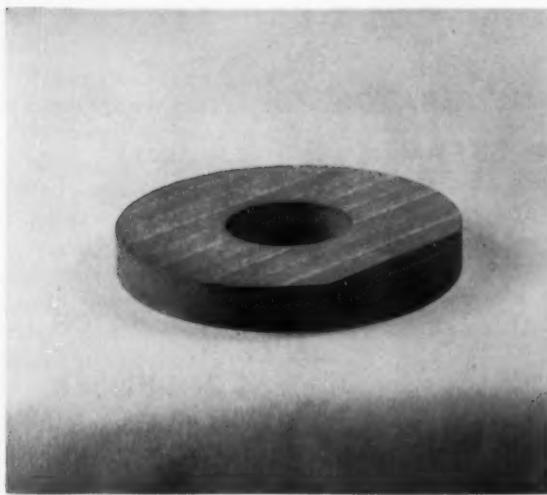


FIG. 3: "Step-down" specimen was used to measure case hardness at various depths below surface.

pering curves for both steels are shown in Fig. 1 (a) and (b).

High Hardness—Prior to nitriding, it was positively established that specimens tempered to Rc 38 or over would not fall below a core hardness of Rc 38 after tempering at 975°F for 50 hours. Thus a high core hardness during the 975° nitriding cycles could be depended upon.

As an added precaution, two nitriding loads were run for each of the conditions of time and temperature tested. Only tempered martensitic structures were subjected to test, since it has been well established that annealed or normalized structures do not provide optimum mechanical or nitriding properties.

Immediately before nitriding, all specimens were carefully cleaned and bonderized. Such treatment is desirable to insure a good surface condition for nitriding. Then the tempered specimens (representing the various core-hardness levels) were nitrided in conventional single-stage cycles for 25, 35, and 50 hours. In all cases, rate of ammonia dissociation was maintained at 20-30 pct.

Higher Temperature—In order to check relative diffusion rates at a higher temperature than 975°F,

two single-stage, 50-hour test loads were run at 1000°F. Based on the results obtained from these various cycles, it was possible to relate the effects of core hardness, time at nitriding, and nitriding temperature to case hardness and case depth.

After nitriding, hardness was measured at fixed distances through the entire nitrided case and into the core material. These measurements were made on ground "step-down" specimens, using the 15N Rockwell scale. The lighter load was chosen in order to avoid having the indenter break through the case and provide a false reading. All core hardness values were measured on the Rockwell "C" scale.

After grinding, all specimens were etched to detect possible grinding burns that might affect hardness readings. Measurements of depth from the top surface of each "step-down" specimen were made with a dial-indicator type gage. Optical measurements of case depth taken on fractured specimens were compared with those obtained after etching with nital.

Not Too Different—From case hardness measurements (Figs. 2a through 2h), it is apparent that the nitriding characteristics of 4140 and 4340 are fairly comparable. Neither material seems to be able to claim

a significant advantage over the other.

At the higher core hardness levels, however, the surface case hardness of 4340 drops off more rapidly than do the measurements for 4140. This holds true despite the fact that the maximum core hardnesses for 4340 (Rc 37-39) are slightly higher than those for 4140 (Rc 36-37).

The effect of core hardness upon nitriding properties is evident for both steels. At the lower core hardness levels—levels at which both steels are easier to machine—case hardness is comparatively low. From the manufacturing standpoint, this might prove disadvantageous.

Core Hardness Important—For both steels, the depth of "white nitride" layer seems to vary directly as a function of time at nitriding at a given temperature. In no instance is this depth appreciable. An increase in time at nitriding does not affect surface hardness but does provide a higher level of hardness to a greater depth below the surface. Effective case depth is moderately sensitive to increased diffusion and change in energy level that are obtained at a slightly higher nitriding temperature (1000°F). Nitride content increases with an increase in core hardness.

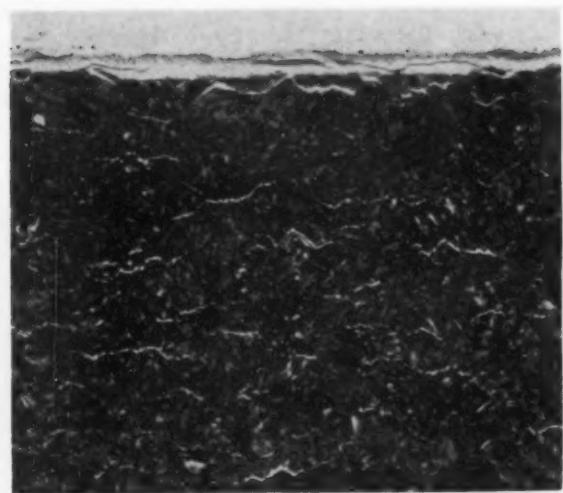
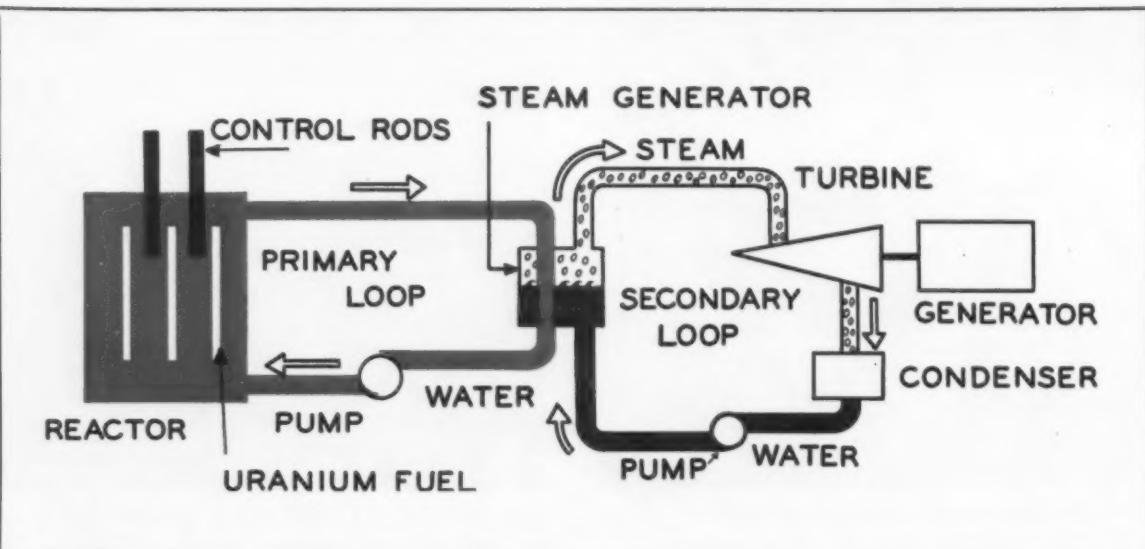


FIG. 4: Typical microstructure of nitrided 4340, 2 pct nital etched for 30 seconds, is shown at 500X.



TWO MAIN PARTS: Nuclear reactor in primary system produces heat energy for transfer to secondary

system containing a steam turbine. (This sketch and all photos courtesy Westinghouse Electric Corp.)

Shippingport Station Forecasts Era of Atom-Electric Power

Mankind is determined to wrest low cost electric power from the atom.

Dedication of the massive Shippingport Atomic Power Station is a landmark in this struggle.

Equally important are the lessons to be learned from its development and operation.

By G. F. Sullivan—Editor*

■ The world's first full scale plant to generate atomic power exclusively for civilian use was dedicated May 26, at Shippingport, near Pittsburgh.

The nuclear part of the plant was built by Westinghouse Electric Corp. for the Atomic Energy Commission at a cost of \$55 million. Duquesne Light Co. footed the \$15-

million bill for the conventional turbine end of the plant and contributed \$5 million to the cost of the nuclear portion.

Plan Power Boost — The plant went critical (i.e., a chain reaction was sustained) on Dec. 2, 1957. By Dec. 23 it was delivering its full rated power of 60,000 kw to the utility's lines. When the present core is replaced with an improved one now being fabricated, it is expected to come up to 100,000 kw.

The first full scale nuclear power plant in the world, at Calder Hall in England, went critical in May, 1956. A second reactor has since been added there but both furnish plutonium for the British weapons program, in addition to 80,000 kw of civilian power.

The first privately owned power reactor is General Electric's at Vallecitos, Calif. It started up in Au-

gust, 1957 and in October began delivering 5000 kw to the Pacific Gas & Electric Co. system. It was built mainly to aid in design of the 100,000-kw plant which GE is building for Commonwealth Edison Co., Chicago.

Most Advanced Design — The pressurized water reactor, the type at Shippingport, is the design which, at least in America, is most advanced. It has been thoroughly tested in the submarine "Nautilus." And it is perhaps not coincidental that the man who supervised the Shippingport project for AEC is also the man responsible for the "Nau-

* Mr. Sullivan is a member of the Advisory Committee on Industrial Information, U. S. Atomic Energy Commission.

tilus," Rear Admiral H. G. Rickover.

Shippingport was not designed to be competitive in cost with conventional power. Rather it is intended to advance the technology of pressurized water reactors. Other types are being studied by AEC, which at the beginning of this year was operating seven experimental power reactors, plus the Army "Package Power" reactor, which also has civilian potential.

And there are four full scale atomic power plants under construction; plants in which private capital is either the sole or the principal source of funds. Their reactors will be rated at a total of 577,000 kw. Nine more are projected under the Commission's Power Reactor Demonstration Program.

Three Major Elements—As the simplified diagram shows, a pressurized water nuclear power plant consists of: A nuclear reactor; a primary loop which transfers hot water under pressure from the reactor to a heat exchanger; and a secondary loop under lower pressure which converts this heat to steam to run a conventional steam turbine and generator.

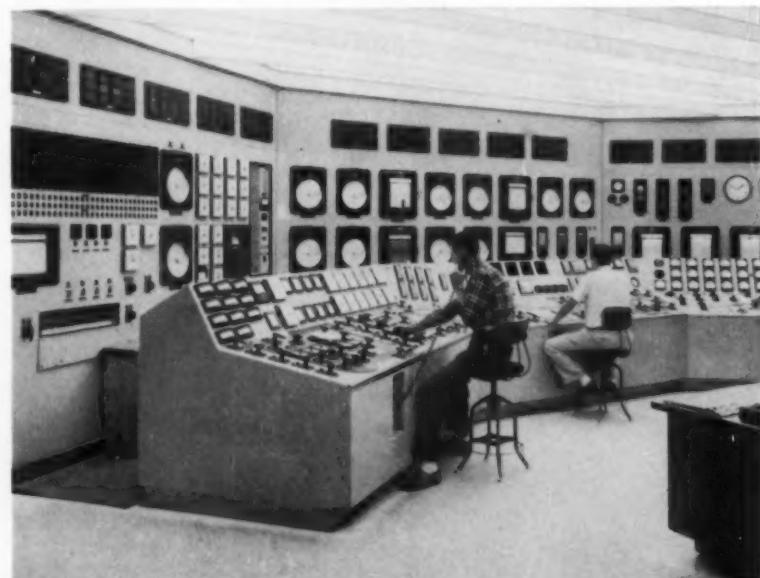
Again oversimplified, the Shippingport reactor consists of a core within a pressure vessel. The vessel, of carbon steel plate and forgings, is $8\frac{1}{4}$ in. thick, about 33 ft high and 9 ft in diam. Its interior is clad with type 304 stainless as a protection against corrosion caused by radiation.

Within this vessel, which is designed for 2000-lb working pressure, is the nuclear core. The core now in use is a group of plates and tubes about 6 ft high and 6 ft in diam. Some 32 of these plate assemblies are seed fuel elements, made of enriched uranium (U-235) clad with Zircalloy-2, a zirconium alloy. Each plate assembly is about $5\frac{1}{2}$ in. sq by 110 in. long. They are of sandwich construction: thin sheets of uranium 235 clad with Zircalloy-2 and separated to permit water passage between the plates.

Water Does Two Jobs—The water, actually high purified river water, acts as coolant and moderator. As a moderator, its job is to slow down fast neutrons to thermal

neutron speed—the most efficient speed to cause fissioning in uranium 235.

The 32 seed elements are arranged in the form of a square in the



MAIN CONTROL ROOM: All main elements from the reactor core to transmission lines are represented on the carefully-arranged console.



FOR UTMOST SAFETY: Welds made on the reactor vessel's thermal insulation were carefully vacuum tested for absolute soundness.

core. They are surrounded, both inside and outside the square, by blanket assemblies, 113 of them. These assemblies are made of cylindrical pellets of natural uranium (U-238) sealed in Zircaloy-2 tubes. They are about the same size and length as the fuel assemblies.

The enriched uranium (U-235) makes it possible to start and sustain a chain reaction. In the natural uranium (U-238) blanket, one part

in each 140 is uranium 235, which is fissionable. During operation, some of the neutron output of the fissionable uranium 235 is absorbed in the uranium 238 blanket. This produces plutonium 239, which is also fissionable by thermal neutrons.

Not a Breeder—It is possible to produce more than one atom of plutonium for every atom of uranium fissioned if the reactor is designed

as a breeder. Shippingport is designed instead as a converter reactor, producing a little less than one plutonium atom for every uranium atom destroyed. This type of conversion is more efficient than breeding when power is the main objective.

Since the quantity of plutonium builds up during the life of the core, the blanket material will produce an increasing portion of the overall power by burning the plutonium in place. Fissioning in the blanket accounts for about half the reactor's power, and may go up to 60 pct as the seed wears down. The seed elements are expected to last 3000 hours at full power, the blanket 8000 hours.

Object of the plant is to get the heat of fission out of the core and into usable form. Water is pumped into the bottom of the reactor vessel at 507°F under normal conditions, and is discharged from the top at 538°F. It goes to a boiler which serves as a heat exchanger to convert it into steam for the turbine.

Four Pumping Loops—Actually, there are four of these "loops" which pump water through the reactor, each with its own pump, piping and heat exchanger. Normally, three are in use.

The pumps and the loops are almost fantastic. Each uses an 18,300-gpm canned motor pump, operating at 2000 psi and pulling 1600 hp. Nor should the piping in the primary loops be confused with anything conventional. It is hollow-forged of type 304 stainless, 18-in. OD x 15-in. ID. The ID is finished to 125 microinches, rms.

Control rods are the major means of controlling the reactor's power. They are of hafnium, extruded in cruciform shape. Since hafnium absorbs neutrons, the rod's function is to move vertically between fuel elements to increase, decrease or stop fission.

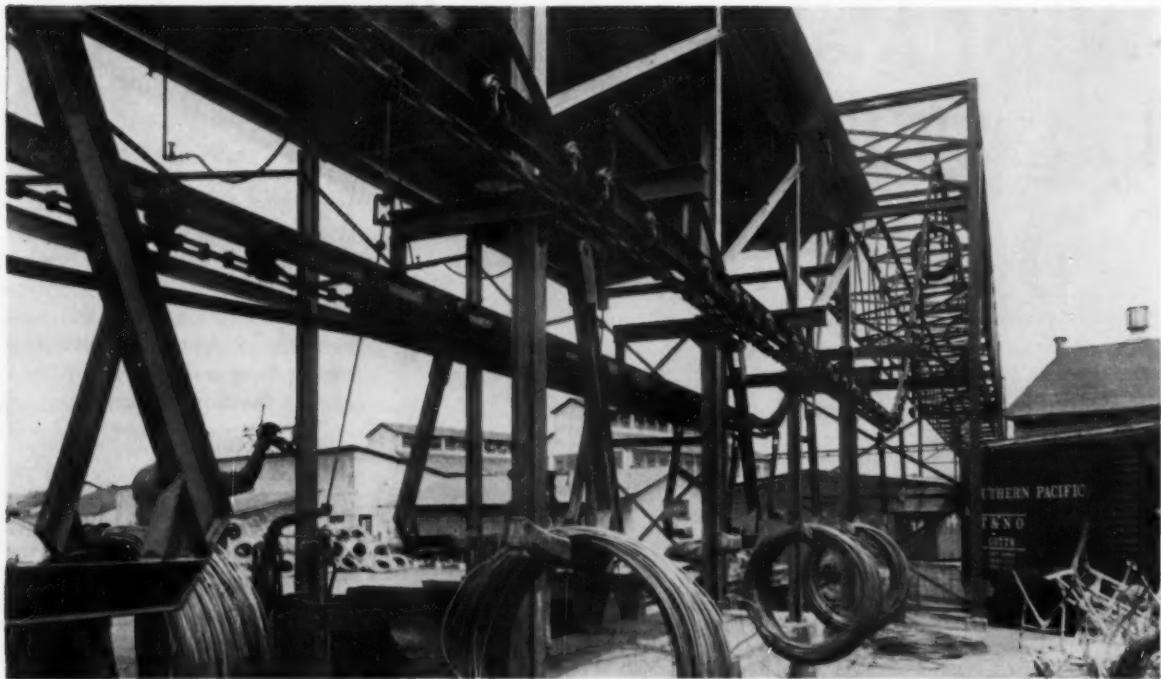
Instrumentation, control and safeguards are also fantastic in their thoroughness. As operating experience builds up, some safeguards may prove overly elaborate.



PRIMARY PUMPER: Designed for zero leakage, each of the four canned motor pumps has a single-stage, 18,300-gpm centrifugal pump.



FOR DEPENDABILITY: Stainless steel, exemplified by these reactor-core components, is widely used in the Shippingport installation.



CLEAR TRACKS: Conveyor rises to 34 ft to cross over six tracks and two buildings before reaching take-

off station. A hoist unloads the coils for delivery to wire mill or storage. Unit conveys up to 450 coils an hour.

Conveyor Bypasses Obstacles In Interplant Handling

New mills are often located a distance from the old ones.

Conveyor route can side-step obstacles to give continuous handling.

■ How would you move coils of hot wire rod several hundred feet across railroad tracks from one process to another? The tracks, plus a row of small buildings rule out the normal surface route.

This was the problem at Atlantic Steel Co., Atlanta. Its new rod mill had to be located a distance away from the existing wire mill.

An overhead trolley conveyor system provided the answer. Built by Link Belt Co., Chicago, the conveyor carries coils on heavy,

counterbalanced carriers, suspended from two pairs of trolleys at 8-ft intervals.

Automatic Loading — The coils, weighing 600 lb, are automatically loaded on the conveyor. On leaving the rod mill they are at 1750°F. A chain handling system carries them to the loading point. During this transfer, the coil temperature drops to 800°-900°F. A rotating tilter flips the coils into position to be picked up by the trolley conveyor. A common drive unit synchronizes the chain and trolley conveyors.

Moving at speeds from 20-60 fpm, the conveyor handles 150-450 carriers an hour. A dogleg in the route dodges a group of buildings. The 46-in. coils are elevated to 34 ft for a distance of 210 ft as

they pass over six railroad tracks and two small buildings. During the trip the coils cool further.

Removal by Hoist — As the conveyor nears the wire mill, it returns to its normal elevation with the trolleys about 8 ft from the ground. At the end of the trip the coils are removed by hoist at a take-off station. They go either to the wire mill or to a storage area outside. Larger sizes of rod, not scheduled for the wire mill, are removed at another take-off station before reaching the end.

Atlantic's new 21-stand mill produces three strands of rod at a time at the rate of 5000 fpm, 51 tons per hour. Sizes range from 3/16-9/32 in. The rod is coiled automatically into 3000-ft coils on any three of six laying reels.

What Makes a Small Firm Grow In a Sliding Market?

By William Czygan—Materials Editor

Today, small business faces a big test. Many firms have never had to cope with uncertain times.

It pays to take a close look at those who've been through some rough spots before—and learned to grow despite many obstacles.

■ How does a small firm not only survive, but continue to grow in the face of a sliding market? This might seem impossible, and it certainly isn't easy. But there are ways. And while Renewal Service, Inc., doesn't claim to have all the answers, it provides some important lessons in small business management and attitudes.

The Philadelphia firm sells cast bronze bearings and bushings. Actually it makes them, too, through a sister company—Bushings, Inc.

Renewal got its start in 1934, doing special machining, grooving, turning and general servicing on sleeve-type bearings. D. O. Thompson and G. N. Fisher were the owners and only employees. Their sole piece of equipment was a small grooving machine which they adapted to a variety of work.

Service Comes First—Service was the watchword from the day their doors opened. It paid off. The company's scope widened to include making new bearings as well—specials that repair-work customers couldn't buy off the shelf, and standard types that weren't available right away. Again, service was the key; a lot of people could make the same piece, but Renewal made a point of doing it faster.

It grew to the point where the separate manufacturing arm, Bushings, Inc., was formed in 1945. This

meant starting a foundry and adding to the production machine shop (the servicing end was retained as a separate function in Renewal).

Well-Rounded Line—Meanwhile, the parent company also expanded. Renewal began building a complete stock of standard bronze bearings and bushings made by others. Bushings, Inc., filled the gaps in and between these regular lines and kept on making the specials.

A favorite expression at Renewal is what Thompson (now president) calls being stock-minded.

Inventory runs anywhere from \$50,000 to \$75,000—actual cost, not resale value. Everyone's constant aim is to keep it the best-rounded stock available anywhere under one roof. And, beyond this, the shop is geared to quickly cut, groove, graphite, bore, turn, mill, drill or otherwise alter any stock



STEADY GROWTH: Part of machine shop at Bushings, Inc., which began with one groover in depression years.

pieces for special requirements.

Alert to New Ways—Another basic principle is keeping up with new ideas. The foundry bought its first centrifugal casting machine in 1943 and was ready for production when customers began asking about centrifugally cast bearings. Today it has three such units and is making about 30 pct (by weight) of its output in this way.

The biggest decision that ever faced Bushings was when melting practice came under scrutiny. The foundry was using four oil-fired furnaces to melt a variety of bronze alloys, including manganese bronze, aluminum bronze, and high-tin materials. Metal losses were high, melting was slow, and working conditions in the foundry were poor—hot, smoky and dirty.

Settle on Induction—High frequency induction melting looked like the answer, and the choice was narrowed down to an Inducto Push-Out furnace made by Inductotherm Corp., Delanco, N. J. Then came the shocker: complete with a 175 kw motor-generator set, control panel, a furnace designed to handle No. 125 crucibles and all installation work, the proposed outfit carried a price tag of about \$40,000.

The management team—Board Chairman Fisher, President Thompson and General Superintendent A. G. Eberle—held meeting after meeting to debate and analyze the unit's potential worth.

Proves Wise—While it was the toughest decision the group ever had to make, it also proved the wisest.

The largest area of savings the new equipment produced was in melting losses. Bushings has to remelt chips and turnings in order to hold finished prices in line and stay in business. Based on average operations (20 heats of 350 lb each per day), melting losses were running about \$240 a day. The Inducto unit has cut these losses 60 pct, or about \$700 in a 5-day week.

Formerly, melting time for the first heat on a particular alloy ran



MODERN MELTING: High frequency induction furnace represents a huge investment for a small company, but attains new levels of efficiency.

1 1/4 hours, with subsequent heats averaging 55 minutes. Sometimes there are as many as 10 different alloys in a single day, which means that many first heats.

Fast on All Heats—The high frequency induction furnace melts first and subsequent heats alike in about 22 minutes. And since melting time is proportional to weight, the Inducto unit melts short heats in considerably less time; the oil-fired furnaces took just about as long on a short heat of, say, 120 lb as they did on a full 350-lb charge.

Electric power cost, on the other hand, is running about three times as high as that of oil (Bushings had been using a low cost No. 5 fuel). Even so, net savings are such that the equipment will pay for itself in 4 to 5 years of normal operation.

New Challenge—In recent years the two firms have been faced with a growing problem: sleeve-type bearings and bushings have lost a

lot of ground to rolling-element bearings. But this, like competition within its own industry, is treated as one of the day-to-day challenges that always confront a small enterprise.

Thompson is convinced the answer lies in research, development, education and promotion, all of which have been weak and haphazard where sleeve-type bearings are concerned.

Accordingly, Bushings spearheaded a move to organize individual efforts of cast-bearing producers into a hard-hitting, long range program. The result is a new trade group, the Cast Bronze Bearings Institute.

Even today, Renewal Services and Bushings, Inc., are small—together they employ only 40 people, and their gross sales last year were \$600,000. But by staying alert, flexible and progressive, no one in the organization doubts they'll attain their goal of a million dollars.

Showroom on Wheels Helps Firm's Distributors

One rule of good salesmanship is to let the prospect see and handle the product.

With hundreds of new items to talk about, Brown & Sharpe follows the rule by putting them on a cross-country tour.

■ If you're like most men, you delight in getting "lost" for an hour or so in a well-equipped hardware store. In so doing you're apt to see — and buy — something new that you can use. You profit by the visit, and so does the hardware dealer.

Except for the fact that it doesn't have a cash register, the success

story behind Brown & Sharpe Mfg. Co.'s Mobile Precision Center is just that simple. It's built so that metalworking executives and shop superintendents can browse among the newest in precision tools, metal cutting tools, screw machine tools and hydraulic products.

And there's plenty to see inside this truck. The company has added over 800 new and improved items to its many product lines in the past 2½ years. Surprisingly, the mobile unit accommodates a liberal sample of the grand total.

Makes Planned Calls—Any industrial products salesman would be tickled to come even fairly close to the number of calls this showroom on wheels makes in an average day: four plant visits (by scheduled appointment) and a solid show-and-tell approach to anywhere from 25 to 200 live prospects at each stop.

Displays inside the van are patterned after those featured in the permanent Precision Center at Providence, R. I., headquarters. Popularity of the latter as a display, demonstration and training facility sparked the idea of a mobile unit for those who couldn't conveniently come to New England.

Scheduled stops are arranged in advance by Brown & Sharpe's territorial distributors. With the whole U. S. for a route, the truck doesn't linger too long in any one area. Result: Each distributor invites his best customers and prospects for these new product showings.

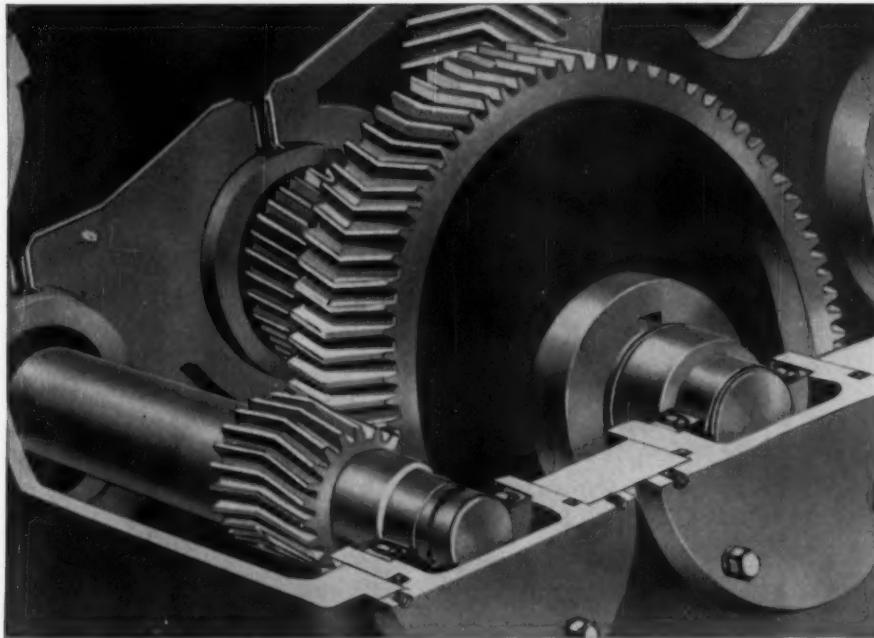
Although distributor salesmen and company sales engineers are on hand at each stop to answer questions, no sales are made from the truck itself. After the unit moves on, it's up to the distributor to do the selling, mail out literature, or otherwise follow up on visitor interest.



WALK-IN SAMPLE CASE: Mobile Precision Center attracts from 25 to 200 interested visitors at each plant stop along its tour route.



OPEN DISPLAYS: Here's a clear and attractive invitation to "handle the merchandise all you want." Visitors accept without urging.



ALLEN SPEED REDUCERS FROM STOCK

ALLEN SPEED REDUCERS—AGMA RATINGS

REDUCER DESIGNATION

	D-6	D-16	D-25	D-40	D-57	D-80	D-114	D-160	D-228	D-320
Ratio	30.3-1	33.2-1	28.4-1	28.4-1	30.9-1	30.5-1	30.9-1	30.3-1	30.1-1	30.0-1
Gearing	Helical				Herringbone					
Thermal Horsepower	11	16	21	34	52	63	81	103	131	187
Horsepower Rating @ 1750 RPM Input	5.8	14.9	24.7	35.4	51.9	63.2	90.2	128.5	180.9	275.9
Peak Torque Rating @ 1750 RPM Input (thousand inch-lbs.)	6.3	17.7	25.2	36.2	57.7	69.4	100.2	140.3	196.1	297.7
Overhung Load Rating Output Shaft Lbs.	950	1250	4000	6800	12600	12600	14300	14500	23400	30800
Shipping Weight Lbs.	200	400	520	860	1580	2250	2400	4200	5150	6350

Heavy-duty Alten speed reducers — herringbone or helical — are designed for hard, continuous use on original equipment or with existing machines. They're in use now on oil field pumping units, dredges, saw mill machinery and other similar applications where unfailing performance is imperative. Alten can deliver from stock. Alten engineers will work with you on special applications to develop the capacity, ratio, reduction, speed, drive and gears that meet your needs best. Write for complete information.

ALLEN

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DESIGNERS AND BUILDERS OF EQUIPMENT SINCE 1889
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Custom-Built Machinery



Custom-Built Machinery



Hydraulic Pumps and Valves



Carbon and Stainless
Steel Fabrication, Machined
and Unmachined



Parts or Assemblies

Gray and Alloy Iron Casting

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Identify the industries that make up your market



Evaluate market potential of each industry



Gear sales effort to market potential



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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 107.

conditions of: high temperature (to 1500°F), low temperature (-300°F), corrosion resistance, high loads (228,000 psi), high speeds (to 30,000 rpm) etc. (Electrofilm, Inc.)

For free copy circle No. 4 on postcard, p. 107

Lithium

Up-to-date facts and figures on lithium and other alkali metals (cesium and rubidium) are included in a 24-page brochure. It covers lithium from its 1807 discovery to uses in high energy fuels and atomic fusion. (Montgomery Explorations, Ltd.)

For free copy circle No. 1 on postcard, p. 107

Dryers, Polishers

Hot sawdust drying and polishing units are outlined in a data sheet. It describes these barrel units and accessories. (Speed-D-Burr Corp.)

For free copy circle No. 2 on postcard, p. 107

Power Drives

A 64-page catalog lists power drives in 8000 ratings. The color coded sections and numbering system make it a handy reference when looking for new electric power drives. (Sterling Electric Motors, Inc.)

For free copy circle No. 3 on postcard, p. 107

Solid Film Lubes

Eight different solid film lubricants are presented in a 16-page catalog. Each of these tackles lube problems which arise under

PVC Linings

Corrosion-proof PVC linings in three types are featured in a handbook. (Kaykor Industries, Inc.)

For free copy circle No. 5 on postcard, p. 107

Roll Grinders

Heavy-duty roll grinders are featured in a 28-page bulletin. It includes cross-section drawings of important machine features, some recent innovations. (Farrel-Birmingham Co., Inc.)

For free copy circle No. 6 on postcard, p. 107

Job-shop Machining

Large, modern machine shop facilities at your service are introduced in a 30-page brochure. It gives details on one firm's engineering departments, pattern, plastics, and template shops and describes the complete scope of the company's facilities for producing dies, jigs and fixtures. (Automotive Div., The Budd Co.)

For free copy circle No. 7 on postcard, p. 107

Rolling Mills

Rolling mills detailed in a comprehensive catalog feature from 20- to 3-in. roll diameters. A section deals with mills for laboratory and advanced development. Wire flat-

tening mills and related accessories are covered. Special features include formulas for selection of mills for rolling strip and wire, and a comparative specification chart for all the maker's rolling mills. (For free copy write on company letterhead to Sales Mgr., Fenn Mfg. Co., Fenn Road, Newington, Conn.)

Air Tools

Pneumatic production equipment is featured in a brochure. Data pages cover air tools for grinding, sanding, drilling, reaming, screw-driving, nutrunning, filing and cutting. (Airetool Mfg. Co.)

For free copy circle No. 8 on postcard, p. 107

Trimming Dies

How a press using versatile dies trims and notches many different pieces is told in a comprehensive 12-page bulletin. Dies trim a wide range of sizes, shapes and stock from 0.005 to 0.250 in. (Vulcan Tool Co.)

For free copy circle No. 9 on postcard, p. 107

Riser Blocks

A data sheet tells how a new principle eliminates errors caused by extra-length height gages used for high check points. It's done with granite riser blocks that literally float on air. (The Herman Stone Co.)

For free copy circle No. 10 on postcard, p. 107

"Speed" Lathes

In 32 pages, a booklet outlines many types of "speed" lathes. These are lathes without tailstocks, with or without a lathe bed. Basically consisting of a mount, a motor, and a chuck (or other work and/or workpiece holder), the unique machine tools are not "auxiliary" units. These "speed lathes" are intended as integral parts of production lines or machine shops. (Schaur Mfg. Co.)

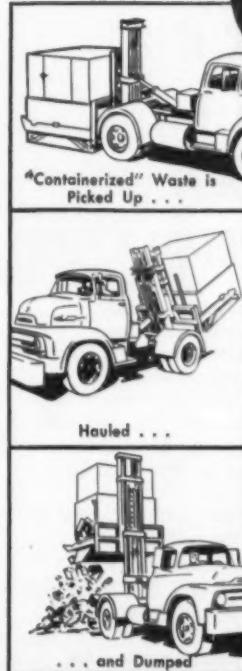
For free copy circle No. 11 on postcard, p. 107

Missile Measurements

"Precision Measuring for Missile Production" is a new brochure's

Driver's Mighty Robot Arms Hoist Giant Pay-Loads of Plant Refuse

THE GRD 304 F-2



Dempster-Dumpster GRD Hauls and Dumps "Containerized" Waste

Industrial leaders, municipalities and contract haulers cut costs by "Containerizing" refuse or waste in clean, enclosed steel containers ranging up to 15 cu. yd. capacity. Handling these big containers is "duck soup" for the GRD, which backs up, engages two lifting pins, hoists the container into carrying position and moves out. Destination for the high-dumping GRD can be a disposal area, railroad gondola car, high-side open trailer or one of the new Dempster-Dumpster Packer Trailers. This 45-yard packer trailer beats the "long-haul" problem by hydraulically compressing 130 to 140 cubic yards of rubbish into its body before being towed to the disposal area. Write today for free bulletin on the GRD.

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GRD prepares to dump into new 45-yard Dempster-Dumpster Packer Trailer

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36 Burt Free Exhaust Fan Ventilators Rout Heat and Fumes Fast in **TRUE TEMPER'S** New Saybrook Forge Plant

Designed and built by The Austin Company, Cleveland, Ohio, True Temper's multi-million-dollar Saybrook Forge Plant uses eighteen 54" and eighteen 42" Burt Free Exhaust Fan ventilators to provide a two-minute air change dependably and economically . . . The entire discharge in Burt Free Exhaust Fan ventilators is vertically upward, with no internal baffles to impede the full flow of air. This highly efficient design provides power capacities of 41,700 cfm for each 54" ventilator and 24,000 cfm for each 42" unit . . . Fresh air at low cost is available for your plants, too, from Burt's complete line. There's a type and size for every ventilating need.



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FREE LITERATURE

title. It describes gages for measuring critical dimensions of critical missile parts. (Federal Products Corp.)

For free copy circle No. 12 on postcard, p. 107

Fork Lift Trucks

You can be years ahead when you use fork lift trucks in a new line, suggests a 16-page brochure. It illustrates the trucks' futuristic materials handling, ease of operation, and maintenance features. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 13 on postcard, p. 107

Pyrometers

Precision-matched pyrometers and thermocouples are illustrated in a 16-page bulletin. These instruments are especially designed for high-heat measurement, including duty in metalworking, smelting and refining, heat treating, foundries. (Raymond F. McHugh & Son.)

For free copy circle No. 14 on postcard, p. 107

No-corrode Coat

A bulletin contains data on a process which gives any mild steel resistance approaching that of stainless steel. (Tube Reducing Corp.)

For free copy circle No. 15 on postcard, p. 107

Jig Borer, Miller

A 4-page bulletin features a new medium size jig boring and milling machine. It describes the accurate machine as having "unlimited possibilities" in jig and fixture work and also in experimental parts manufacturing. (Suburban Machine Co.)

For free copy circle No. 16 on postcard, p. 107

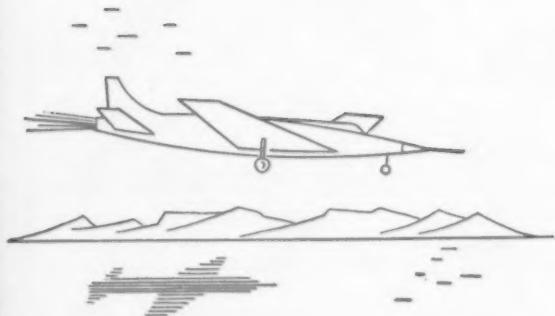
Trap Maintenance

Something new in trap maintenance, a heat-affected crayon, is briefly discussed in new literature. If a defective trap permits steam to "blow through," temperature remains the same above and below the trap. This crayon quickly spots the trouble. (Tempil Corp.)

For free copy circle No. 17 on postcard, p. 107



COURTESY ALUMINUM COMPANY OF AMERICA



Increase Production

with FINKL DIE BLOCKS

...the aircraft industry does!

These two 14 x 35 x 114" FX die blocks, made from Finkl electric furnace steel, and weighing 15,800 pounds each, are used for producing precision aluminum landing gear rib forgings.

Finkl FX die blocks are noted for their long production runs and economy because:

- FX covers the full usable hardness range from Temper H (477-444 BHN) to Temper 4 (293-269 BHN).

- FX produces the greatest number of forgings per impression because its well balanced alloy content offers uniform hardness and freedom from temper brittleness. Relatively high tempering temperature promotes ductility and elimination of residual stresses.

- FX Special Machining Quality appreciably reduces shanking and sinking time.

These proved advantages can also mean savings to you with more pieces per die and better deliveries to your customers.

Save money by talking to a Finkl representative the next time you are considering die blocks or forgings.



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**DESIGNED
to meet today's
toughest demands**

**THE NEW
BROWN & SHARPE
No. 510
SURFACE GRINDING
MACHINE**



**PRICED
to meet
today's
equipment
budgets**

Tool and die shops, and other users of hand feed surface grinders, face increasingly tough demands today, — for high precision, for cost reduction.

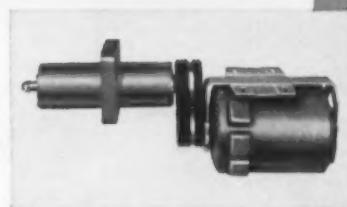
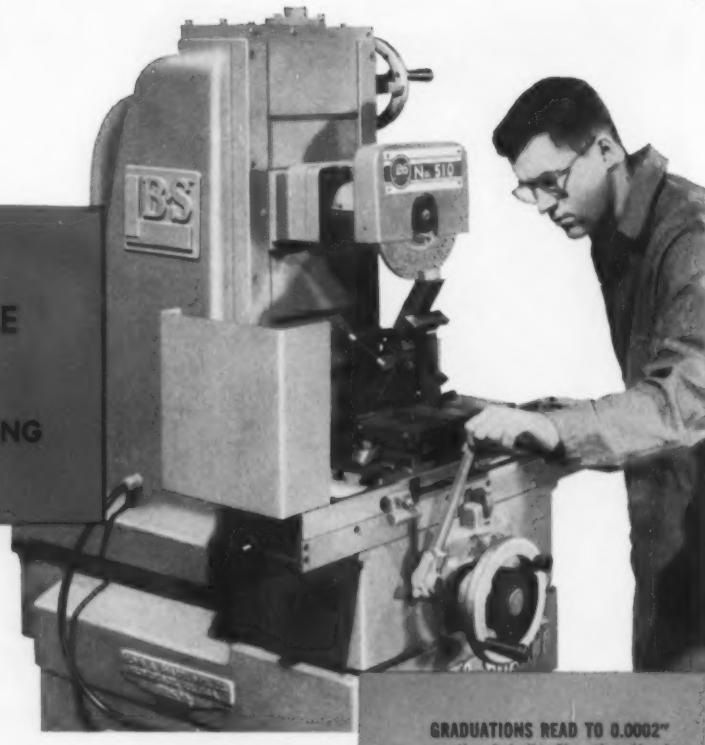
The new B&S No. 510 Surface Grinder design is based on an extensive survey of these demands and needs. Add Brown & Sharpe's first-hand experience as tool manufacturing specialists, and you'll see why the new No. 510 provides the required plus in precision, work range, and efficiency.

THE LOW COST of the No. 510 is a welcome surprise to everyone who sees its many advantages demonstrated. Get details. Why settle for surface grinders of limited performance and capacity, when the same investment will buy the new No. 510? For full information, write: Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

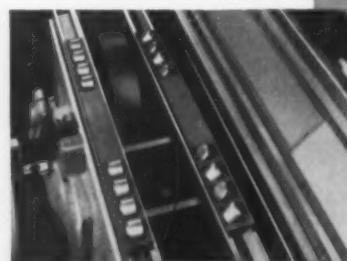
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"FULL POWER" ORIFLEX DRIVE



LAPPED TABLE ROLLERS



"ONE SHOT" LUBRICATION

GRADUATIONS READ TO 0.0002" on the Spindle Elevating Handwheel, and on the adjustable dial of the Crossfeed Handwheel, which provides close control of transverse feed.

FULL TRAVEL TABLE OF 11" is attained by moving the Table Lever only 180°.

► "ORIFLEX DRIVE" to unit-type wheel spindle (left) is through five "O rings" from 1 hp motor in vibration-free mountings. The No. 510 is also available with a direct motor drive spindle.

RUGGED, CAST IRON spindle slide, upright, and table base distribute 95% of the machines' 1225 lb. weight above the heavy gage sheet steel base. Base cabinet provides liberal storage space for accessories.

► TABLE glides on precision ground and lapped straight rollers (left) forming 90° "V" and flat guide ways — permits easy, smooth operation and preserves precision alignment.

► "ONE SHOT" OILER (left) lubricates entire machine by depressing plunger.

MOVABLE SPINDLE UPRIGHT for crossfeed contributes to dependable precision slot and form grinding.

CAPACITY Grinds work 11" long, 5" wide, and 12" high with 8" dia. wheel . . . 12½" high with 7" dia. wheel.

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Cutoff, Groove Tools

Carbide insert cutoff and grooving tools introduced in a 4-page bulletin change in 15 seconds without disturbing the setup or losing center. A self-centering V-groove insert support is copper-clad to dissipate harmful heat. Tool bodies fit all standard machines. (Portage Double-Quick, Inc.)

For free copy circle No. 18 on postcard

Lift Trucks

A 6-page folder lists specifications of heavy-duty fork trucks. Six models carry from 8000 to 40,000-lb loads. (Gerlinger Carrier Co.)

For free copy circle No. 19 on postcard

Precision Machines

Precision performance machines and a machine maker's new expanded facilities are featured in a 48-page booklet. The comprehensive publication pictures many types of precision equipment and the plant to build them. (Motch & Merryweather Machinery Co.)

For free copy circle No. 20 on postcard

Air Presses

Single and double-acting air presses are illustrated in an 8-page brochure. Included are formulas for figuring compressor horsepower and air consumption. (Famco Machine Co.)

For free copy circle No. 21 on postcard

Diamond Wheels

An American Standard Identification Code for diamond wheels is condensed into a new catalog. Re-

commendations appear for selection, care and use of diamond wheels. (United States Diamond Wheel Co.)

For free copy circle No. 22 on postcard

Safe Solvent

Non-hazardous and non-flammable, a new solvent degreaser is covered in a data sheet. It dilutes with water only. Even undiluted, the concentrate has a flash point near 200°F. (Brulin & Co., Inc.)

For free copy circle No. 23 on postcard

Grinding Wheels

Toolroom grinding wheels appear in a 10-page folder. (Cincinnati Milling Products.)

For free copy circle No. 24 on postcard

Resistance Welding

Resistance welding at work is demonstrated in seven case histories. The 12-page publication lists advantages gained by these users. (Sciaky Bros., Inc.)

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Atomizing Nozzles

New wall-mounting pneumatic atomizing nozzles introduced in a data sheet fit any wall thickness. They provide easy, leak-proof installation. (Spraying Systems Co.)

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Die Sets

Unusual features that can be built into special die sets are the subjects of a new publication. (The Product Machine Co.)

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Internal Collet

An internal collet to replace arbors and gadgets is featured in a bulletin. It fits all standard 5C drawbars, fixtures, grinders, etc. (Royal Products.)

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Tool Lapping

Instructions for tool lapping are included in a booklet. Tools are carbides. Using diamond com-

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FREE LITERATURE

pound, a finishing machine with meehanite lapping wheels does the job. (Hyprez Div., Engis Equipment Co.)

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Gas Compression

A brochure describes pre-engineered central compressors supplying air or gases at 3500 to 12,000 psi at point of use. Systems provide 47 to 75 scfm at minus 85°F dew point or lower. (Cardox Corp.)

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Industrial Pumps

Pumps for industrial uses are outlined in an 8-page bulletin. These pumps handle various hydraulic and pumping services on machine tools, machinery and other industrial applications.

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Dust Collectors

Wet and dry type dust collectors and auxiliary equipment are featured in a 6-page folder. These include: cyclones, centrifugal and dynamic washers, dust and fiber filters, discharge gates and trickle valves. (The Ducon Co.)

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Vacuum Pumps

Combination two-stage vacuum pumps are detailed in a data sheet. These pumps have fast pump-down and high efficiency at low micron ranges. (Beach-Russ Co.)

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Quick Fasteners

Quick-opening fasteners are covered in a 24-page catalog. A quarter-turn and they're open or closed. (Fastex Div., Illinois Tool Works.)

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Rotary Cutting Tools

A 48-page manual describes many types of rotary cutting tools.

These include carbides, abrasives and diamond tools. (Precise Products Corp.)

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Machine Tools

One maker's machine tool line is illustrated in a 12-page bulletin. The line encompasses presses, band saws, shears, millers, etc. (Famco Machine Co.)

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Hydraulic Lifts

Hydraulic lift tables are featured in an 8-page booklet. It tells how such tables simplify problems of lifting, feeding and work-positioning. (Southworth Machine Co.)

For free copy circle No. 37 on postcard

Magnetic Chucks

A general catalog describes a line of electromagnetic, permanent magnetic, and vacuum chucks, demagnetizers, chuck control equipment, etc. (O. S. Walker Co., Inc.)

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Closed-circuit TV

Closed-circuit industrial television systems are fully described in a 6-page pamphlet. (Insul-8 Corp.)

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Cold-Heading

Three typical cost-cutting cases are contained in a cold-heading publication. These cases involve a spacer, a small machine part, and a threaded fastener. (John Hassall, Inc.)

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Die Stops

Automatic die stops for use in strip or coil-fed stamping are covered in new literature. These stops use brackets that permit mounting either on top or front of a die. The stop installs in 10 to 15 minutes. It automatically stops stock feed at a predestined place. (Danly Machine Specialties, Inc.)

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Bronze Over Steel Fights Wear

Pistons in hydraulic presses are subject to extreme friction and pressure. When they wear out in service, costly downtime and maintenance are necessary.

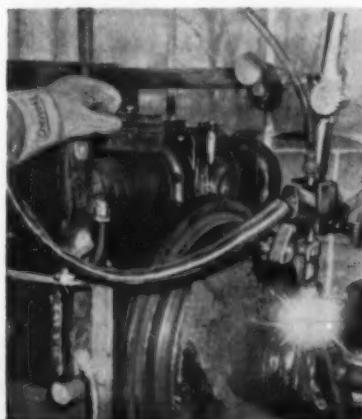
One builder bronze-surfaces its pistons for long life.

■ Bronze-surfacing of steel pistons gives them long life without need for excessive repairs, reports a maker of hydraulic equipment. Operating under extreme friction and pressure, weak pistons can result in costly shutdowns when they wear out in service.

Employing Sigma welding, Hydraulic Press Mfg. Co., a division of Koehring Co., Mount Gilead, Ohio, thinks it has pretty well minimized such possible expensive downtime. The firm finds that bronze-surfacing makes the pistons

especially resistant to friction without damaging the strong core of steel necessary to withstand high pressure.

Positions Manually — The press manufacturer uses a semi-automatic Sigma SWM-2 welding machine. Adapted to a permanent installation, it surfaces pistons ranging



Surfacing a 6-in. diam piston is this Sigma SWM-2 welder.

from 4 to 20-in. diam. Oxfeld No. 62 wire, 1/16-in. diam, deposits automatically as the piston rotates under the welding gun.

The gun positions manually for each circumferential bead by means of a rack adjustment. It takes three to five passes to deposit a $\frac{1}{4}$ to $\frac{3}{8}$ -in.

in. thick surface on the pistons.

Hardens With Heat — Each piston is heat-treated to increase hardness of the bronze surface.

Sigma welding, an inert-gas con-



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Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 107. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

COES KNIFE COMPANY

Precision Ground Machine Ways

Hardened tool steel ways, guides, and special wear plates, inseparably forge welded to tough, machineable backings. Hardness, shapes, dimensions, and mounting holes to your specifications.

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MACHINE KNIVES

Standard and special blades of solid or composite steel, for all machine knife applications.

THE IRON AGE, May 29, 1958

109

TECHNICAL BRIEFS

sumable-electrode welding process, is a development of Linde Co., Union Carbide Corp., New York. The Oxweld No. 25M bronze wire serves as the electrode, producing sound deposits at high deposition rates. To insure surface perfection, Linde's 99.995 pct pure argon gas shields the weld zone from atmospheric contamination.

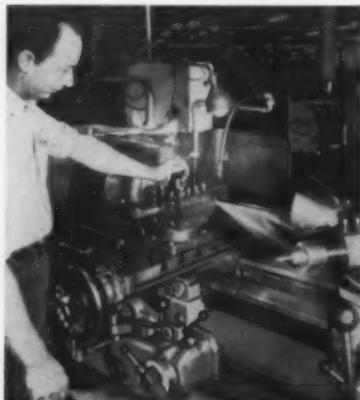
Machining

Carbide-tip gundrill setup reduces cost per piece

Savings of at least \$9 apiece result from adaption of a new gundrilling setup. So reports a shop which now uses carbide-tipped gundrill methods to make economical holes in ten different workpieces.

Using a turret lathe, Emhart Mfg. Co.'s Empire Division Plant #3, Hartford, Conn., finds that gundrilling has become a routine

practice. One piece machined by the new method is a cast-iron part requiring a 14½-in. long, 1¼-in. diam gundrilled hole. A setup man chucks the part in a No. 7A Jones



Gundrill on this lathe cuts at 253 rpm and 0.005 ipr.

& Lamson turret lathe on its large, previously turned diameter.

The opposite end is then turned to fit the bearing of an outboard support. This end is prepared for the gundrill by spotting, drilling,

and boring a hole 1-in. deep, the same size as the gundrill.

Gundrill Finishes It—The gundrill completes the hole. It drills this particular piece at 253 rpm with a feed of 0.005 ipr. The drill, a product of Madison Industries Inc., Big Rapids, Mich., incorporates a Kennametal Grade K6 carbide insert tip. The Hartford company specifies this tip for the tool.

Holes gundrilled on the lathe are exceptionally straight and round, the firm reports; finish is excellent and has a mirror-like appearance. Scrap losses are far less than when it required seven separate operations to make these holes.

Old Way Was Complex—Formerly, after rough turning the large end and facing the flange, the flange end was chucked; a gundrill drilled a 7 7/32-in. hole with a different set-up. The hole was reamed to fit a broach; the hole was broached to 1.252/1.250 in.



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New Production Ideas

Equipment, Methods and Services

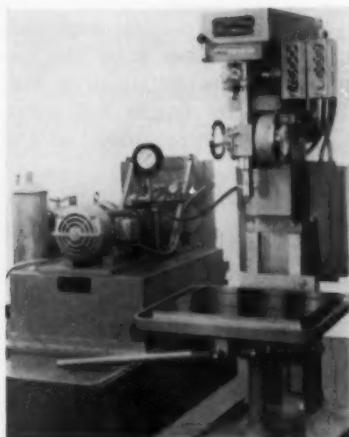


Gear Finisher Uses Throwaway Abrasive Tools

Hardened small- and medium-sized gears up to 12-in. diam can now be economically finished to quiet - operating smoothness with abrasive throwaway tools. The quietness—without matching gears in pairs—is due to tightened dimensional accuracy, excellent surface finish and contact pattern, and reduced noise characteristics. All this is possible with a new gear-finishing machine. The machine also permits salvaging of gears otherwise too noisy to meet desired standards.

Smoothness and life characteristics of gears in service are also said to be improved. The compact machine (only 5 x 6½ ft floor space) adapts to either high or low production. It applies throwaway tooling to the crossed-axis finishing of hardened gear teeth. The tools quickly and effectively "clean up" hard spur and helical gear teeth to improve the finish and sound characteristics of the gears. Average cycle time is about 1-min. (Michigan Tool Co.)

For more data circle No. 42 on postcard, p. 107



High Pressure Coolant Setup Aids Gundrilling

For production work, a new high pressure coolant system fits into carbide - tipped gundrilling operations. The system comes with a choice of two motors. A 5-hp motor delivers 10 gph; a 10-hp one, 20 gph. With either motor, the unit still has a 140-gal oil capacity. Pressures are adjustable to 1000 psi. Oil return from the drill being used collects in a settling tank with a removable strainer. From the settling tank, oil gets pumped by separate low - pressure pumps

through two replaceable filters that filter as fine as 10 microns. Oil temperature in the coolant system is thermostatically regulated through an adjustable temperature control. Ordinarily it's a water cooling system; refrigeration can be used if necessary, though. Each oil reservoir tank has its own oil level gage. An alarm system indicates when there's a low supply of oil. The entire setup measures 70 x 51 x 44-in. (Edlund Machinery Co.)

For more data circle No. 43 on postcard, p. 107



Machine Drills, Taps Pieces At Same Time

Drilling and tapping simultaneously, this machine reaches production rates up to 400 parts an hour. Conceived to handle a specific operation, the versatile unit is easily adaptable to many different jobs. Using 16 or 24 spindles, the machine has half of them on one side of its head. These drill. They're driven by a standard electric motor. Those on the other side are driven by a high-reversal-duty hydraulic

tapping motor. In one installation, the machine uses a simple five-position push-through fixture for drilling and tapping front frames for electric typewriters. A slip spindle plate, bored for 15½-in. nose adjusting spindles, simplifies set-up for the two different frames which may be processed. Loading is done during machine operations; unloading is automatic as parts drop down a chute. During processing, parts are

NEW EQUIPMENT

located and held by spring-loaded locating pins. A rotating table can be used to maintain high production rates if the user desires. (National Automatic Tool Co., Inc.)

For more data circle No. 44 on postcard, p. 107

Slide-rule Watch

Engineers who want to calculate and read time simultaneously can use a new watch combination. A chronograph and circular slide-rule rolled into one, it allows figuring of

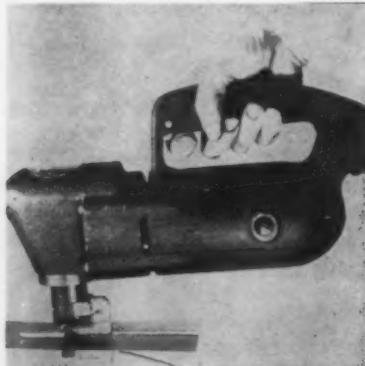


multiplication, division, ratios, exchange, conversion, interest, etc. The watch has an all-steel case, 17-jewel movement. (Wakmann Watch Co., Inc.)

For more data circle No. 45 on postcard, p. 107

Nibbler

A new portable nibbler cuts woven wire, wire cloth, and gasket up to 3/16-in. Used as a portable



tool or mounted on a table, it also cuts sheet metal without distortion by nibbling a continuous 1/4-in.

strip. Two models are available. One cuts up to 3/32 wire; a heavier duty unit cuts up to 3/16 wire. Both operate on 110-v ac or dc. (Modern Mfg. Co., Inc.)

For more data circle No. 46 on postcard, p. 107

Drum Switch

A new drum switch starts, stops and reverses small ac and dc motors. It's furnished in surface mounted NEMA Type 1 enclosures, or with an oil-tight cover plate for cavity mounting in a machine base. The switch features a wrap-around cover which completely exposes the switch mechanism for easy wiring. (Allen-Bradley Co.)

For more data circle No. 47 on postcard, p. 107

ID Thickness Tester

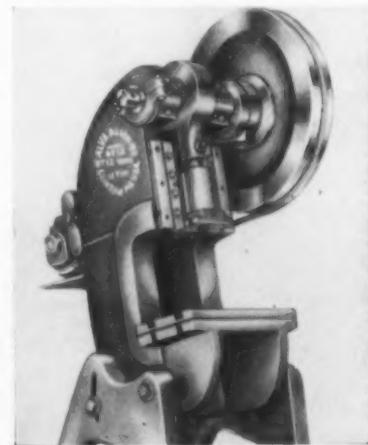
Equipped with a new right-angle probe, non-destructive testers can now measure most coatings and films on the inside diameters of pipes, bores in castings and similar items down to 1/2-in. ID. Special probes handle even smaller sizes. Each thickness reading takes only two seconds on this electronic instrument, which operates on eddy-current principles. The probe measures a wide variety of metallic and non-metallic coatings such as plating, anodizing, paint, plastics and ceramics. (Unit Process Assemblies, Inc.)

For more data circle No. 48 on postcard, p. 107

Punch Press

This rugged 12-ton press is designed to give long trouble-free performance. Its frame is of high-quality gray iron with supports and ribs at all points subject to strain. A bronze bearing flywheel weighs 160 lb, assuring ample press power. The crankshaft is 1 1/4-in. diam, turned, ground and polished, and has a tension adjustable brake. Large, bronze main bearings are 1 1/4-in. diam and 3-in. long. Specially designed, hardened striking pins in the flywheel team with a hardened clutch engaging fin to give reliable action. The clutch is of single fin, knife type de-

signs with all contact parts hardened for long wearing life. The press can be easily changed from repeat (single stroke) to non-repeat (continu-

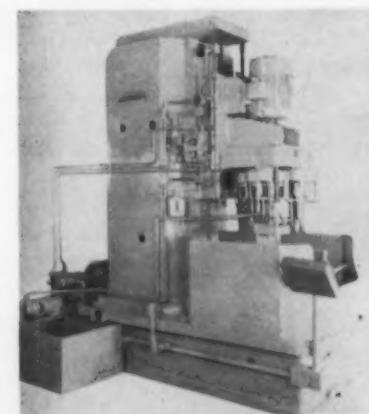


ous) action. Ram easily adjusts (full 1 1/4 in.) and locks. (Alva Allen Industries)

For more data circle No. 49 on postcard, p. 107

Indexing Machine

This four-station automatic dial type indexing machine employs a 12-spindle multiple head. The machine performs operations on both universal joint flanges and yokes. The head has three separate clusters



of four spindles each. Spindles in each cluster are moveable by means of geared double eccentrics so that proper bolt circle for a given flange or yoke is obtained. The unit's design keeps changeover time to a minimum. Adjustable tool holders are used. (W. K. Millholland Machinery Co., Inc.)

For more data circle No. 50 on postcard, p. 107

Finishing Unit

Primarily a deburring unit, this machine offers many other finishing advantages. They fall into three general categories: (1) polishing and surface improvement; (2) extremely fine micro finish of the order of 3 to 4 rms; and (3) stress relief. Deburring and polishing can also be done on the inside diameters of parts,



such as inside gears and hydraulic pistons. The machine uses a fine abrasive media, normally between 8 and 14 mesh. High polishing and surfacing results are the general rule on all steel parts. This polishing and surfacing improvement takes place during the deburring process. (Roto-Finish Co.)

For more data circle No. 51 on postcard, p. 107

Steam Generator

Designed around a unique electro-chemical principle, compact new generators produce steam from water in 45 seconds. Electrically operated, the non-immersion type units turn feed water (32°) into steam without the use of heating elements. Models giving up to three boiler horsepower per hour occupy a total space only slightly more than 3 cu. ft. (Lectro-Heat Products Corp.)

For more data circle No. 52 on postcard, p. 107

Parts Washer

Making the most of every available inch of valuable floor space, a new parts washing machine uses space directly above its base.

Two such machines have been built for a big tool manufacturer. They wash wrench jaws after broaching. Compared to other horizontal conveyor type washers occupying 44 sq ft of floor space, this vertical type requires only 16 sq ft. (Ranshoff, Inc.)

For more data circle No. 53 on postcard, p. 107

Truck Hydraulic Setup

A supercharged hydraulic oil system for lift trucks does away with

surging in the hydraulic tank. Danger of getting air bubbles into the lines and pump is also eliminated. This new development is standard on one maker's rider-type gas, L-P-gas and electric powered lift trucks. Presence of air in excessive amounts in a lift truck hydraulic system can lower hoist speeds, cause hoist cavitation and, in extreme cases, lead to pump failure. (Yale & Towne Mfg. Co.)

For more data circle No. 54 on postcard, p. 107

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New Clear Protective Coating for All Metals... as safe and easy to handle as Water!

New method of protection incorporates corrosion inhibitors in a water-soluble polymer base. Dries to an extremely thin, tough, durable coating—clear in color. Does not chemically affect base metal or any post-treatments. Used as a protective treatment alone or to enhance value of post-treatments.

Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

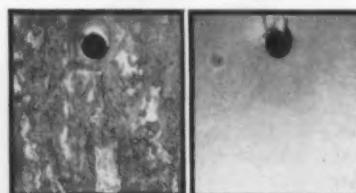
THE PROCESS

Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly bonds to the metal surface without reacting with the surface.

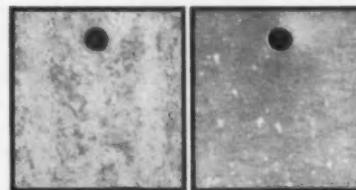
THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water-resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides pro-

tection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to any metal—wet or dry—treated or untreated. All metals can be processed in one operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000:

- 1 It can be applied to any clean metal simply by dip, brush or spray. No special equipment is required.
- 2 Saves time—just apply and dry—no reaction time required.
- 3 No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
- 4 Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM

Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.



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The Iron Age Summary

Is Scrap Forecasting Steel Rise?

Scrap market strength in the Midwest could be a straw in the wind, say observers.

Others argue that it's nothing more than a reaction to unrealistically low prices.

■ Does the iron and steel scrap market forecast a reversal of form in the steel market?

This question was being asked this week as Midwestern scrap prices showed continuing strength at the same time as steel men were talking of a turn for the better in steel demand.

Mills Pay More—It could be that the prospect of a better steel ingot rate, however slim, was encouraging scrap brokers and dealers to hold out for higher prices after months of strictly delaying tactics. The mills are finding they have to pay higher prices on new orders.

Most observers are inclined to believe the scrap price upturn is nothing more than a temporary cor-

rection—a reaction to distress selling that did not reflect the true cost of processing and storing of scrap.

Another Dip Coming?—It's expected that scrap prices may be in for another dip later in the year when the mills look for a hot weather - vacation setback in their own market. This could come in July when many metalworking plants are planning vacation shutdowns.

Nevertheless, the current upturn in scrap quotations indicates that the market is highly sensitive to changes in the tempo of steel demand. It means that prices have been depressed to an unrealistic low due to the mills' refusal to enter the market except on their own terms.

Trade Sentiment—One scrap man puts it this way: "When so little scrap is moving, dealers and brokers are willing to part with small tonnages at giveaway prices just to get enough money to keep the lights burning and to pay the rent. When it looks as though steel demand is

about to pick up, they hold out for better prices."

Most of the bullishness appears to center in the Chicago area, although the fever has spread also to Youngstown, Detroit, Cleveland, and Pittsburgh. The East and West coasts were shaky to weak.

Industrial Scrap—Another factor in the market picture is the growing lack of prime industrial scrap due to low production levels of the automotive companies. This was the situation in Detroit, where a drop in industrial offerings plus increased steel production strengthened the market there. In Cleveland, a rumored shutdown of area automotive plants had the same effect.

Brokers in Chicago last week were paying more for some grades of scrap than they were getting the week previous for consumer delivered orders. Strength also was noted in Pittsburgh at the broker and dealer level. Some yards there were refusing spot offers for openhearth scrap \$3 to \$4 above the market.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,485	Last Week 1,498	Month Ago 1,289	Year Ago 2,253
Ingot Index				
(1947-1949=100)	92.4	93.2	80.2	140.2
Operating Rates				
Chicago	65.0	58.0*	55.0	87.0
Pittsburgh	53.5	52.0	50.0	88.5
Philadelphia	59.5	61.0	59.0	102.0
Valley	36.5	40.0	36.0	72.0
West	72.0	74.0*	70.0	101.0
Cleveland	31.0	30.0	29.5	87.0
Buffalo	46.0	46.0	34.5	95.0
Detroit	50.0	46.0	12.0	88.0
South	67.0	67.0	60.0	93.0
South Ohio River	59.0	61.0	28.0	92.0
Upper Ohio River	73.0	75.0	62.0	85.5
St. Louis	78.0	78.0	75.0	90.0
Northeast	31.0	31.0	31.0	66.5
Aggregate				
	...	55.5	47.8	88.0

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	\$66.49	\$66.49	\$66.49	\$66.56
Scrap, No. 1 hvy (Gross Ton)	\$35.33	\$34.00	\$31.50	\$47.50
No. 2 bundles	\$26.17	\$25.50	\$22.83	\$39.83
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	11.30	11.30	11.80	14.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	94.625	94.375*	94.25	98.375
Zinc, E. St. Louis	10.00	10.00	10.00	11.50

Refractory Supply Pinch Remote

Steel mills can count on good deliveries of refractories even if demand spurts.

Suppliers are geared for fast service despite condition of market.

■ Are refractory users facing a possible supply pinch?

The recent modest upturn in steel production brought a sharp rise in refractory shipments. One major refractory company reports a 15 pct jump in orders over the past 30 days.

This immediate reaction shows how closely steel mills are tailoring the buying of refractories to immediate needs.

More Truck Shipments — "At one time a rush order meant we

loaded a car the next day," says a refractories man. "The customer got his bricks in two weeks or so. Today we get a call in the afternoon for delivery the next morning."

To live with this kind of demand, refractory plants have been making more and more truck shipments in recent months. They are maintaining stocks of both standard and semi-standard bricks.

The question is: Could rush service be sustained if there was a big increase in business? And could steel mills get along without fast delivery in a rapid production climb?

Eye to the Future — On the whole refractory men see little danger of even a temporary pinch. One plant has been paring down its own stocks but feels it would take a

really extreme change to create a shortage.

"If an openhearth shop went from 6 to 12 furnaces and then had to reline two of the furnaces that had been working, it would be in trouble," says a sales executive. "Otherwise no."

Another refractory plant says it is loaded with stock and has capacity lying idle. It foresees no pinch although it remembers the wartime period when refractory deliveries ranged up to a year and a half. That was the war. Today refractory plants are geared to fast service even in prosperous times.

Mills Shun Storage — They have found that steel mills and others want to avoid the double handling of storage. Before the last increase in refractory prices, steel mills showed little interest in buying extra brick. The mills said the extra labor involved in storage more than offset the price gain.

The steel and nonferrous slumps have done little to check the swing to better refractories. A few furnaces have been converted to lower priced brick. Tests on a sprung roof, basic openhearth were suspended for lack of orders.

Price Picture Muddled — Work on all-basic openhearts continues. One mill recently got 300 heats from a basic roof that was arched and specially supported. It plans to reline the furnace and to use the same construction on three more openhearts.

The refractories price picture is muddled. Some producers point to extensive price cutting in the industry. Clay bricks in particular have been subject to discounting. Feeling in some quarters is that there will be no price increases while competition is so sharp.



PRESSING AHEAD: Basic refractory brick is pressed at Hammond, Ind., plant of Harbison-Walker Refractories Co., opened last year. Brick makers are keeping alert to customer needs.



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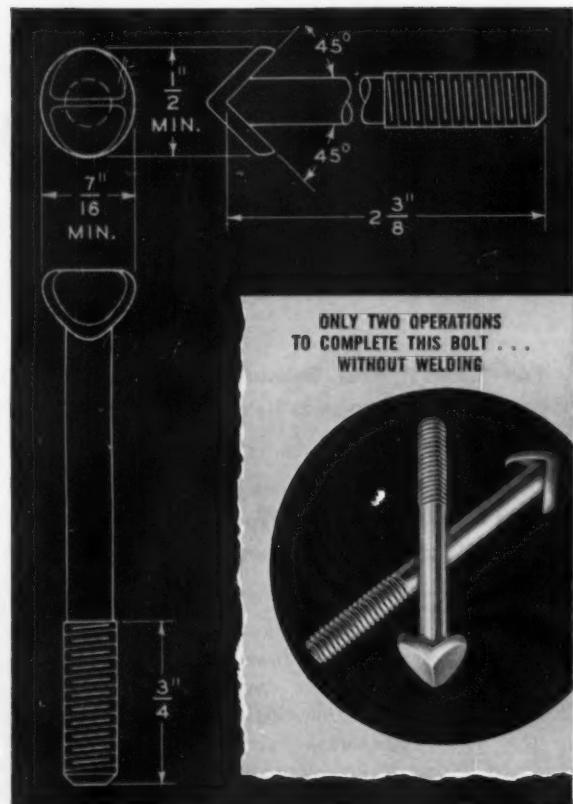


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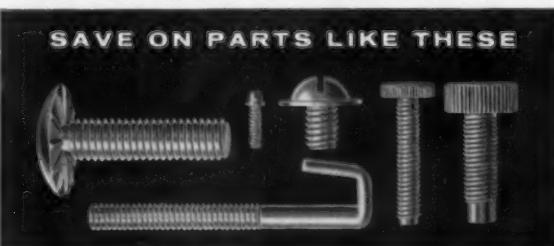
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Delivery Estimates Stretch a Little

For the first time in months mill delivery promises show signs of lengthening.

Increases of about a week reported by producers in Chicago, Cleveland and Detroit market areas.

■ Mill delivery promises, down to rock bottom levels for many months, have started to lengthen.

This new trend, which could be reversed during a slow summer, is still encouraging steel salesmen. It reflects the recent upturn in buying, mainly by small tonnage users.

In the latest IRON AGE survey, sheet, strip, bar, butt-weld pipe, and plate deliveries have increased about a week at Chicago, Cleveland, and Detroit. Shipping estimates stayed the same at Pittsburgh although that market had a little

better tone. There was also no change in mill delivery promises on both the East and West Coast. However, these markets had never contracted quite as much as other areas.

Pinpointing the exact reason for recent market improvement remains difficult. Price hedging by buyers and more optimism among steel users have been listed as causes. But one mill man rejects both these explanations. "Our customers just ran out of steel," he says.

Sheet and Strip — Automotive steel buyers are not as inactive as had been expected. They are still ordering sheet and strip for quick delivery. Tonnages involved are not large but steel salesmen regard the orders as a good sign. Several Detroit area mills say they have already taken in enough automotive steel orders this month to equal

or pass any month this year except January.

Appliance makers are also buying sheet. And small tonnage users continue placing orders for quick delivery. Low inventories seem the reason behind this buying with price hedging a minor factor. Some mills are concerned that present orders may represent steel the buyers would normally purchase in July and August.

Plates and Shapes — Both products are showing mild, but steady gains. May shipments for many producers are running ahead of April levels.

Plate deliveries at **Midwest** mills have lengthened slightly. An **Eastern** producer has lifted mill operation from 40 to 70 pct of capacity. Some railroad carbuilding, tank manufacturing, and a few line-pipe orders are aiding plate.

Structural producers believe vacation cutbacks by fabricators will be unusually severe this year. Mill order books on structurals, despite market gains, are still far from full.

Pipe and Tubing — Standard pipe is better, but not substantially. Most types of welded pipe can be delivered right from stock. There's no improvement in oil country seamless. Mills and jobbers can fill orders quickly from their inventories. Linepipe under 12 inches is available within four weeks. Delivery of larger sizes may range up to several months, depending on rolling schedules.

Wire — Mills report a sharp pick-up in construction products and a steady improvement in orders from manufacturing customers. One **Pittsburgh** producer recently booked in a single day almost half the tonnage sold the previous month. Some **Midwestern** mills are putting on extra turns as industrial wire deliveries lengthen to five weeks.

Stainless — Orders from warehouses and dealers are helping stainless sales a little. The aid is not great, but producers are welcoming it. Continued market slowness makes operations difficult.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	2-4 wks	2-5 wks	2-4 wks	2-4 wks	3-5 wks	4 wks
HR Carbon Sheet	1-2 wks	2-4 wks	2-3 wks	2-3 wks	2-3 wks	3-4 wks
CR Carbon Strip	2-4 wks	2-4 wks	2-4 wks	2-4 wks	3-5 wks	4 wks
HR Carbon Strip	1-2 wks	2-4 wks	2-3 wks	2-3 wks	2-3 wks	3-4 wks
HR Carbon Bars	1-2 wks	2-3 wks	2 wks	1-3 wks	2-4 wks	2-4 wks
CF Carbon Bars	1-4 wks	2-4 wks	1 wk	1-3 wks	1-3 wks	1-2 wks
Heavy Plate	1-2 wks	2-4 wks			3-5 wks	4-6 wks
Light Plate	1-2 wks	2-3 wks	2-3 wks		2-3 wks	4-6 wks
Merchant Wire	1 wk	2-4 wks	1 wk		Stock	3-4 wks
Oil Country Goods	Stock	1-3 wks	2-3 wks		Stock	
Linepipe	1-8 wks	2-4 wks	3-4 wks		2-4 wks	4-6 wks
Buttweld Pipe	1 wk	1-2 wks	1 wk	1-2 wks	Stock	2-4 wks
Std. Structural	1-4 wks	1-4 wks		1-4 wks	2-4 wks	4-6 wks
CR Stainless Sheet	2-4 wks		1-2 wks	1-2 wks	1-2 wks	
CR Stainless Strip	2-3 wks		1-2 wks	1-2 wks	1-2 wks	

COMPARISON OF PRICES

(Effective May 26, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	May 26 1958	May 26 1958	Apr. 29 1958	May 27 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.975¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.80
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.875
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stain's C-R strip (No. 302)	52.00	52.00	52.00	50.80

Tin and Terneplate: (per base box)

Tinplate (1.60 lb.) cokes	\$10.30	\$10.30	\$10.30	\$10.30
Tin plates, electro (0.60 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. terne	9.55	9.55	9.55	9.55

Bars and Shapes: (per pound)

Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50

Wire: (per pound)

Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
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Rails: (per 100 lb.)

Heavy rails	\$5.525	\$5.525	\$5.525	\$5.275
Light rails	6.50	6.50	6.50	6.25

Semifinished Steel: (per net ton)

Rerolling billets	\$77.50	\$77.50	\$77.50	\$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50

Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
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Wire Rods and Skelp: (per pound)

Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225

Finished Steel Composite: (per pound)

Base price	5.967¢	5.967¢	5.967¢	5.670¢
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Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

COMPARISON OF PRICES

(Effective May 26, 1958)

	May 26 1958	May 20 1958	April 29 1958	May 27 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$70.97	\$70.97	\$70.97	\$68.88
Foundry, Valley	66.50	66.50	65.00	65.00
Foundry, Southern Cin'ti	75.87	78.87	78.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	65.00	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	65.00	65.00
Malleable, Valley	66.50	66.50	65.00	65.00
Ferromanganese 74-76 pct Mn, cents per lb†	12.25	12.25	12.25	12.75

Pig Iron Composite: (per gross ton)

Pig iron	\$66.49	\$66.49	\$66.49	\$64.56
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	(per gross ton)			
No. 1 steel, Pittsburgh	\$37.50	\$35.50	\$32.50	\$47.50
No. 1 steel, Phila. area	34.00	34.00	34.50	51.50
No. 1 steel, Chicago	34.50	32.50	27.50	43.50
No. 1 bundles, Detroit	26.50	23.50	21.50	39.00
Low phos., Youngstown	37.50	37.50	32.50	48.50
No. 1 mach'y cast, Pittsburgh	48.50	48.50	48.50	56.50
No. 1 mach'y cast, Phila.	47.50	47.50	47.50	56.50
No. 1 mach'y cast, Chicago	46.50	44.50	41.50	47.50

	(per gross ton)			
No. 1 hvy. melting scrap	\$35.33	\$34.00	\$31.50	\$47.50
No. 2 bundles	26.17	25.50	22.83	39.83

	(per net ton at oven)			
Furnace coke, prompt	\$15.88	\$15.88	\$15.88	\$15.88
Foundry coke, prompt	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19	\$17.50-\$19

	(cents per pound to large buyers)			
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	94.825¢	94.375¢	94.25	98.375
Zinc, East St. Louis	10.00	10.00	10.00	11.50
Lead, St. Louis	11.30	11.30	11.80	14.80
Aluminum, virgin ingot	26.10	26.10	26.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

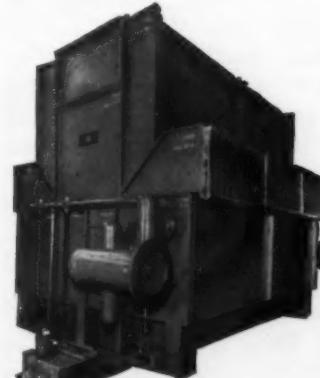
Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Write for Descriptive Bulletin 130.

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Chicago Mills Buy, Hopes Surge

For the fourth straight week the Chicago district paced market gains.

But while optimism prevails, there are some valid reasons for caution.

■ The Chicago scrap market surged upward again and the hopes of scrap dealers in most other markets surged with it.

In spite of the fact there was little mill buying outside of the Chicago district, openhearth scrap prices rose in sympathy in Pittsburgh, Cleveland, Cincinnati, St. Louis, and New York.

These increases are supported by stronger mill operating rates in the past two weeks and the scarcity of material coming into dealer yards. The dealers are optimistic. Having held out this long, they are determined to wait for higher prices. It's adding pressure to the upward trend.

But there is still reason for caution. There are serious doubts as to the real strength of the market with the ingot rate still down and mill stocks high. A repeat of the February flurry is possible.

Furthermore, new-found optimism in Detroit is tempered by the fact that the real market strength won't be known until industrial lists close and mills indicate their buying plans.

The uncertainty of new export orders has dampened spirits in the port districts. A sizable cut in export would seriously affect the Philadelphia market, for instance,

where overseas shipments currently account for about 90 pct of the market.

Carried along by Midwest optimism, The IRON AGE No. 1 heavy melting Composite Price increased \$1.33 to \$35.33.

Pittsburgh — Prices of the best scrap grades are up another \$1 or \$2 as the strength of the West has taken hold here despite a lack of local mill support. Local trading remains light. But brokers say it will take more money to buy loose even the small amount of scrap required. Having held out this long, dealers seem determined to wait for higher prices.

Chicago — Pushed by stronger mill operating rates, heavy dealer pressure for better prices, and a spurt in mill buying at advanced prices, this market continued its rapid climb of recent weeks. All grades are affected, though cast has been more sluggish than others. Industrial and railroad grades show particular strength. Even No. 2 dealer bundles, the scrap grade in greatest supply here, are showing remarkable advances.

Philadelphia — The strength of the Midwest is not being felt here. Little scrap is moving and only one district mill shows any signs of interest in buying. The possibility that export buyers may reduce their orders by 15 or 20 pct injects a weak note in the market.

New York — Prices of steelmaking and some cast grades rose slightly because of strength in con-

suming districts. Stainless is unchanged, but a price rise soon would be no surprise. Turnings continue in the doldrums.

Detroit — There has been little activity in the market, but dealers are bullish—an attitude which is forcing the market up in small moves. However, true market strength won't be known until industrial scrap lists close and mills show their buying intentions. No. 1 bundles were incorrectly quoted last week. Correct price was \$25-\$26.

Cleveland — Dealer optimism is growing as they sense an upturn. Those who have sold to meet current expenses are pretty well cleaned out. Others are holding on for higher prices. Auto list tonnage in the area for June is about 12,000—same level as May. Speculation may push the price up.

St. Louis — A strong tone prevails here, even though scrap movement is slowing down. Railroad lists brought higher prices with quantities offered limited. Mills are buying cautiously.

Birmingham — Brokers and dealers feel that prices will go no lower and that an upward trend is in the offing—particularly since low prices have all but dried up scrap sources.

Cincinnati — Market is up conservatively \$1 on appraisal. Signs point to major mills staying in the market during June. There isn't much scrap around and production lists have lesser tonnage.

Buffalo — Prices are unchanged in a dull market. Local mills have stepped up activity but this has not been reflected in prices. Mills apparently have enough scrap in inventory.

Boston — Things are looking better. Some scrap has been moving in the area, but it hasn't been reflected in prices as yet.

West Coast — Prices in Los Angeles firmed slightly after last week's \$2 to \$4 drop. Movement of scrap is slow. Mill inventories are high.

SCRAP PRICES

(Effective May 26, 1958)

Pittsburgh

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and ms. turn.	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	40.00 to 41.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast	48.00 to 49.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	105.00
430 bundles and solids	95.00 to 100.00
410 turnings	45.00

Chicago

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	44.00 to 45.00
Low phos. punch'gs plate	41.00 to 42.00
Low phos. 2 ft and under	40.00 to 41.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	47.00 to 48.00
Rerolling rails	54.00 to 55.00
Rails 2 ft and under	51.00 to 52.00
Locomotive tires cut	48.00 to 49.00
Cut bolsters & side frames	45.00 to 46.00
Angles and splice bars	49.00 to 50.00
RR steel car axles	58.00 to 59.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast	46.00 to 47.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00
Cast iron brake shoes	27.00 to 28.00
Cast iron wheels	34.00 to 35.00
Malleable	56.00 to 57.00
Stove plate	37.00 to 38.00
Steel car wheels	41.00 to 42.00
Stainless	
18-8 bundles and solids	165.00 to 170.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	95.00 to 100.00
410 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	\$33.00 to \$35.00
No. 2 hvy. melting	29.00 to 31.00
No. 1 dealer bundles	33.00 to 35.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	33.00 to 35.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	15.00 to 16.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Clean cast. chem. borings	24.00 to 25.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft and under	39.00 to 40.00
Low phos. punch'gs	39.00 to 40.00
Elec. furnace bundles	34.00 to 35.00
Heavy turnings	28.00 to 29.00
RR steel wheels	42.50 to 43.50
RR spring steel	42.50 to 43.50
Rails 18 in. and under	56.00 to 58.00
Cupola cast	37.00 to 38.00
Heavy breakable cast	39.00 to 40.00
Cast iron car wheels	43.00 to 44.00
Malleable	58.00 to 59.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Low phos. plate	32.00 to 33.00
Structurals and plate, 2 ft and under	35.00 to 36.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
RR steel wheels	36.00 to 37.00
RR spring steel	32.00 to 33.00
RR couplers and knuckles	32.00 to 33.00
No. 1 machinery cast	43.00 to 44.00
No. 1 cupola cast	39.00 to 40.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$32.50 to \$33.50
No. 2 hvy. melting	24.50 to 25.50
No. 1 dealer bundles	32.50 to 33.50
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	21.50 to 22.50
No. 1 busheling	32.50 to 33.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	37.00 to 38.00
Drop forge flashings	32.50 to 33.50
Low phos. punch'gs plate	33.50 to 34.50
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR hvy. melting	35.00 to 36.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	17.00 to 18.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast	46.00 to 47.00
Stove plate	42.00 to 43.00
Malleable	58.00 to 59.00
Stainless	
18-8 bundles and solids	160.00 to 165.00
18-8 turnings	85.00 to 90.00
430 bundles	75.00 to 80.00
430 turnings	30.00 to 35.00

Buffalo

No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	26.00 to 27.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Low phos. plate	32.00 to 33.00
Structurals and plate, 2 ft and under	35.00 to 36.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
RR steel wheels	36.00 to 37.00
RR spring steel	32.00 to 33.00
RR couplers and knuckles	32.00 to 33.00
No. 1 machinery cast	43.00 to 44.00
No. 1 cupola cast	39.00 to 40.00

St. Louis

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	36.00 to 37.00
Rails, random lengths	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	51.00 to 52.00
RR specialties	41.00 to 42.00
Cupola cast	43.00 to 44.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	35.00 to 36.00
Stove plate	38.00 to 39.00
Cast iron car wheels	41.00 to 42.00
Rerolling rails	47.00 to 48.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	27.00 to 28.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	43.00 to 44.00
Rails, 18 in. and under	47.00 to 48.00
Angles and splice bars	39.00 to 40.00
Rerolling rails	40.00 to 47.00
No. 1 cupola cast	48.00 to 49.00
Stove plate	48.00 to 49.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	38.00 to 39.00

Youngstown

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	17.50 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	37.00 to 38.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	23.00 to 24.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	34.00 to 35.00
Automotive cast	35.00 to 36.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	23.00 to 24.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs plate	26.00 to 27.00
18-8 bundles and solids	155.00 to 160.00
18-8 turnings	55.00 to 60.00
430 bundles and solids	70.00 to 75.00
410 turnings	30.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	3.00 to 4.00
Mixed bor. and short turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	14.00 to 15.00
No. 1 machinery cast	21.00 to 22.00
Mixed cupola cast	26.00 to 27.00
Heavy breakable cast	27.00 to 28.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	22.00 to 23.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	45.00

Los Angeles

No. 1 hvy. melting	\$30.00 to \$32.00
No. 2 hvy. melting	28.00 to 30.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	14.00 to 17.00
Machine shop turn.	9.00
Shoveling turnings	11.00
Cast iron borings	11.00
No. 1 RR hvy. melting	31.00 to 32.00

Seaton Plan Goes To Congress

It sticks pretty close to the original outline.

But a per pound ceiling is put on payment of subsidies to the domestic producers.

Observers say public hearings are likely.

■ The Seaton Plan to subsidize domestic copper, lead, zinc, tungsten, and fluorspar producers has been officially presented to Congress.

It adheres basically to the original outline announced several weeks ago by Interior Secretary Fred A. Seaton. There had been some speculation that some changes would be made to increase the plan's chances of passing Congress. The initial announcement met sharp industry opposition.

Added — Something has been added, but it is not likely to make many opponents change their minds.

In his original outline, Secretary Seaton suggested payment to domestic producers of the difference between what they actually receive in the domestic market and a stabilization price. This is not changed, but the plan presented to Congress limits this payment.

"The Secretary (of Interior) shall provide that no stabilization payment made pursuant to this section on the recoverable content of any ores or concentrates shall exceed the following for:

Copper 3½¢ per lb
Lead 3¾¢ per lb

Zinc 2½¢ per lb

Tungsten \$18 per sh. ton WO₃

Fluorspar \$8 per sh. ton"

While Secretary Seaton appears to view this as a safeguard to keep

the program from getting out of hand, some observers say it would tend to provide a floor for domestic prices assuming no further major weaknesses develop. Here's how they say it might work for the major metals:

Stabilization price	Payment Ceiling	Floor
Copper:		
27½¢	3½¢	24¢
Lead:		
14¾¢	3¾¢	11¾¢
Zinc:		
12¾¢	2½¢	10½¢
(per lb)		

This floor is very close to current prices, which don't seem to be discouraging imports. And imports are the seat of the trouble according to many domestic producers.

Currently the proposal is in the hands of the heads of the Senate and the House of Representatives. The next step will be for a member of the Interior Committees in both houses to sponsor the bill. It will then be sent to committee at which time a decision will be made on whether to hold public hearings.

General opinion in Washington is there's a very good chance public hearings will be held, and that the bill is unlikely to hit the floor without at least a few changes.

Copper

A wave of buying pushed custom smelter copper up ½¢ per lb, to 24¢, on May 22. Demand eased off somewhat, but overall sales levels still are improved over a month ago.

Phelps Dodge Corp. cut back its domestic production again, the fifth time in the last 18 months. Operations in Arizona will be dropped by

20 pct.

Robert C. Page, company president, remarked, "This action shows dramatically why bills co-sponsored by 14 Senators and 16 Representatives were offered last January to re-establish the copper import tax at 4¢ a lb, and to increase the copper 'peril point' . . . to 30¢ a lb."

Clyde E. Weed, chairman of the board, Anaconda Co., told shareholders last week, "In the second half, or by the fourth quarter of this year, there should be an improved domestic copper demand because of depletion of inventories and consumers return to the market for durable goods."

It looks like 6500 brass mill workers in Waterbury, Conn., area will be asked to climb off the wage escalator. They are entitled to a 2¢ per hour cost-of-living wage hike in June. Scovill Mfg. Co. has asked their workers to skip it this time. Observers say other mills in the area will make the same appeal. The union, UAW Copper & Brass Council, is advising workers not to pass up the 2¢, that they have made "ample sacrifices."

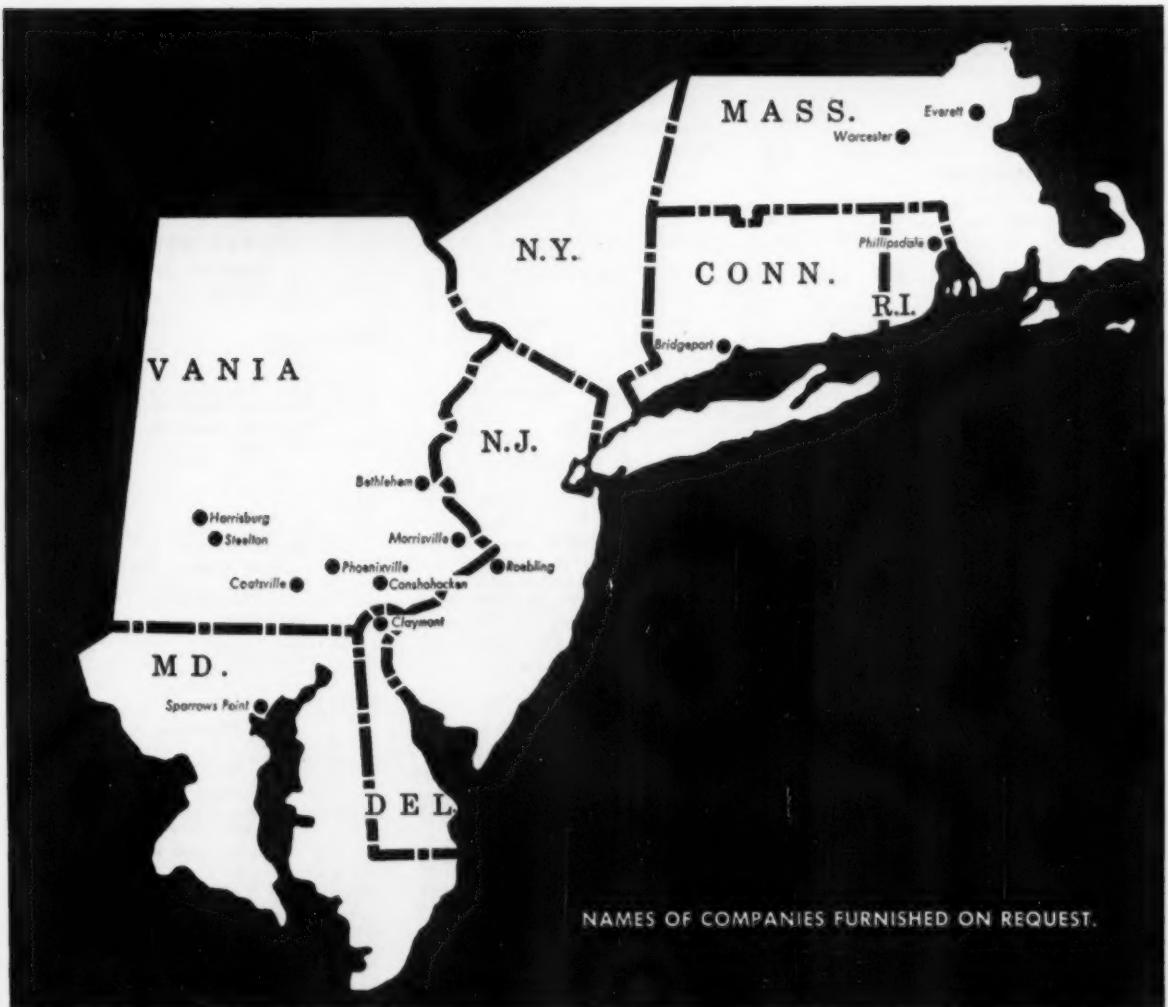
Tin prices for the week: May 21—94.375; May 22—94.375; May 23—94.50; May 26—94.625; May 27—94.625.*

* Estimate

Primary Prices

Items per lb	Current price	last price	date of change
Aluminum pig	24.00	25.00	4/1/58
Aluminum ingot	26.10	29.10	4/1/58
Copper (E)	29.00	27.00	1/13/58
Copper (CS)	24.00	23.75	5/22/58
Copper (L)	29.00	27.00	1/13/58
Lead, St. L.	11.30	11.80	5/14/58
Lead, N. Y.	11.50	12.00	5/14/58
Magnesium ingot	38.00	34.00	8/13/58
Magnesium pig	38.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	188-200	200-250	4/1/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot 1st allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 124.



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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet (Mill Finish and Plate)

(*"F"* temper except 6061-0)

Alloy	002	.051	.136- 249	.250- 3
1100, 3003	44.6	42.3	41.1	41.7
5052	52.0	46.9	45.2	44.4
6061-0	49.4	45.0	43.2	43.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	58.4-62.1
12-14	45.7-47.2	59.3-63.8
24-26	49.0-49.5	70.1-74.8
36-38	58.0-58.6	94.2-97.8

Screw Machine Stock—2011-T-3

Size"	1/4	3/8-5/8	1/2-1	1 1/4-1 1/2
Price	61.0	60.5	59.0	56.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"	72	96	120	144
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	250 3.00	250- 2.00	.188	.081	.032
AZ31B Stand, Grade		67.9	69.0	77.9	108.1	
AZ31B Spec.		93.3	95.7	108.7	171.3	
Tread Plate		70.6	71.7			
Tooling Plate		73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

"A" Nickel Monel Inconel

Sheet, CR	126	106	125
Strip, CR	124	108	128
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	87	...	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13	.....	45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07	.....	41.38	50.48
Muntz Metal	45.19	.....	41.00	.....
Bomm. Bz.	46.98	47.52	46.92	49.54
Mang. Bz.	50.81	.....	44.91	.....
Phos. Bz. 5%	67.17	.....	67.67	.....

TITANIUM

(Freight included in 5000 lbs)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.96; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.25-\$5.50; alloy, \$5.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.	29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be	\$74.75
Beryllium copper, per lb conta'd Be, \$43.00	
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading	\$71.50
Bismuth, ton lots	\$2.25
Cadmium, del'd	\$1.55
Calcium, 99.9% small lots	\$4.55
Chromium, 99.8% metallic basis	\$1.31
Cobalt, 97-99% (per lb)	\$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami, Okla., refined	\$9.50 to \$50.00
Gold, U. S. Treas., per troy oz.	\$35.00
Indium, 99.9%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$80 to \$90
Lithium, 98%	\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb.	59.00
Merkury, dollars per 76-lb flask, f.o.b. New York	\$228 to \$231
Nickel oxide sinter at Copper Cliff, Ont., contained nickel	71.25
Palladium, dollars per troy oz.	\$19 to \$21
Platinum, dollars per troy oz.	\$67 to \$70
Rhodium	\$120.00 to \$125.00
Silver ingots (¢ per troy oz.)	88.625
Thorium, per kg.	\$43.00
Vanadium	\$3.45
Zirconium sponge	\$5.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 Ingot	25.25
No. 115	24.25
No. 120	24.25
No. 123	23.50
80-10-10 Ingot	29.25
No. 305	27.25
No. 315	27.25
88-10-2 Ingot	36.25
No. 210	32.00
No. 215	28.75
No. 405	21.25
Manganese bronze No. 421	23.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	24.00-24.25
0.30 copper max.	23.75-24.00
0.60 copper max.	24.00-24.25
Piston alloys (No. 122 type)	23.25-24.25
No. 12 alum. (No. 2 grade)	21.00-21.75
108 alloy	21.50-22.25
195 alloy	24.00-25.50
12 alloy (0.60 copper max.)	22.75-24.00
AXS-679 (1 pct zinc)	21.25-22.25

(Effective May 26, 1958)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1	95-97 1/2%	22.50-23.50
Grade 2	92-95%	21.00-21.75
Grade 3	90-92%	20.00-20.75
Grade 4	85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

Heavy	Turnings
Copper	21
Yellow brass	16 1/2
Red brass	18 1/2
Comm. bronze	19 1/2
Mang. bronze	14 1/2
Yellow brass rod ends	15 1/2

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	20 1/2
No. 2 copper wire	18 1/2
Light copper	16 1/2
No. 1 composition	18 1/2
No. 1 comp. turnings	18
Hvy. yellow brass solids	13
Brass pipe	15
Radiators	14 1/2

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

Mixed old cast	12	—13
Mixed new clips	14 1/2	—15 1/2
Mixed turnings, dry	13 1/2	—13 1/2

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass	17 1/2	—18 1/2
No. 1 copper wire	17 1/2	—18 1/2
No. 2 copper wire	15 1/2	—16 1/2
Light copper	13 1/2	—14 1/2
Auto radiators (unsweated)	11	—11 1/2
No. 1 composition	14 1/2	—15
No. 1 composition turnings	13 1/2	—14
Cocks and faucets	12	—12 1/2
Clean heavy yellow brass	10	—10 1/2
Brass pipe	12	—12 1/2
New soft brass clippings	13	—13 1/2
No. 1 brass rod turnings	10 1/2	—11

Aluminum

Alum. pistons and struts	5	—5 1/2
Aluminum crankcases	9 1/2	—10
1100 (28) aluminum clippings	12 1/2	—13
Old sheet and utensils	9 1/2	—10
Borings and turnings	6	—6 1/2

Industrial castings	9 1/2	—10
2024 (248) clippings	11	—11 1/2

Zinc

New zinc clippings	4	—4 1/2
Old zinc	3	—3 1/2
Zinc routings	1 1/2	—2
Old die cast scrap	1 1/2	—1 1/2

Nickel and Monel

Pure nickel clippings	42-45
Clean nickel turnings	37-40
Nickel anodes	42-45
Nickel rod ends	42-45
New Monel clippings	28-29
Clean Monel turnings	20-23
Old sheet Monel	25-26

Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

IRON AGE		*Identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.													
STEEL PRICES		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP						
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hat-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled	
EAST	Bethlehem, Pa.					5.325 B3	7.80 B3	5.325 B3							
	Buffalo, N. Y.	\$77.50 R3, B3	\$96.00 R3, B3	\$114.00 R3, B3	6.225 B3	5.325 B3	7.80 B3	5.325 B3	4.925 R3, B3	7.15 S10	7.325 B3				
	Phila., Pa.									7.70 P15					
	Harrison, N. J.													15.05 C11	
	Conshohocken, Pa.		\$101.00 A2	\$121.00 A2						4.975 A2		7.325 A2			
	New Bedford, Mass.										7.60 R6				
	Johnstown, Pa.	\$77.50 B3	\$96.00 B3	\$114.00 B3		5.325 B3	7.80 B3								
	Boston, Mass.										7.70 T8			15.40 T8	
	New Haven, Conn.										7.60 D1				
	Baltimore, Md.										7.15 T8				
	Phoenixville, Pa.					5.325 P2		5.325 P2							
	Sparrows Pt., Md.								4.925 B3		7.325 B3				
	New Britain, Bridgeport, Wallingford, Conn.					\$114.00 N8					7.60 W1, S7				
	Pawtucket, R. I.										7.70 N7			15.40 N7	
	Worcester, Mass.										7.70 A5			15.20 T8	
MIDDLE WEST	Alton, Ill.								5.125 L1						
	Ashland, Ky.								4.925 A7						
	Canton-Massillon, Dover, Ohio		\$98.50 R3	\$114.00 R3, T5						7.15 G#		10.45 G#		14.85 C11	
	Chicago, Ill., Franklin Park, Ill., Evanston, Ill.	\$77.50 U1, R3	\$96.00 U1, R3, W8	\$114.00 U1, R3, W8	6.225 U1	5.275 U1, W8, P13	7.75 U1, Y1 W8	5.275 U1	4.925 W8, N4, A1	7.25 A1, T8 MB				8.10 W8, S9, J3	15.05 A1, S9, G4
	Cleveland, Ohio										7.15 A5, J3		10.45 A5	8.10 J3	
	Detroit, Mich.					\$114.00 R5				5.825 G3, M2	7.25 M2, D1, D2, G3, P11	7.425 G3	10.60 D2, 10.55 G3	8.10 G3	
	Anderson, Ind.										7.15 G#				
	Duluth, Minn.														
	Gary, Ind., Harbor, Indiana	\$77.50 U1	\$96.00 U1	\$114.00 U1, Y1		5.275 U1, J3	7.75 U1, J3	5.275 J3	4.925 U1, J3, Y1	7.15 Y1	7.325 U1, J3, Y1	10.60 Y1	8.10 U1, Y1		
	Sterling, Ill.	\$77.50 N4				5.275 N4			5.025 N4						15.20 J3
	Indianapolis, Ind.										7.30 J3				8.10 A9
	Newport, Ky.														
	Middletown, Ohio														
	Niles, Warren, Ohio														
WEST	Sharon, Pa.		\$96.00 S1, C79	\$114.00 C10, S1					4.925 R3, S1	7.15 R3, T4 S1	7.325 R3, S1	10.50 S1, 10.45 R3	8.10 S1	15.05 S1	
	Owensboro, Ky.	\$77.50 G5	\$96.00 G5	\$114.00 G5											
	Pittsburgh, Pa., Midland, Pa., Butler, Pa., Aliquippa, Pa.	\$77.50 U1, P6	\$96.00 U1, C11, P6	\$114.00 U1, C11, B7	6.225 U1	5.275 U1, J3	7.75 U1, J3	5.275 U1	4.925 P6	7.15 J3, B4				8.10 S9	15.05 S9
	Weirton, Wheeling, Follansbee, W. Va.					6.225 W3	5.275 W3		5.275 W3	4.925 W3	7.15 W3, F3	7.325 W3	10.50 W3		
	Youngstown, Ohio	\$77.50 R3	\$96.00 Y1, C10	\$114.00 Y1				7.75 Y1			7.15 Y1, J3	7.325 U1, Y1	10.65 Y1	8.10 U1, Y1	15.05 J3, 10.65 Y1
	Fontana, Cal.	\$88.00 K1	\$105.50 K1	\$135.00 K1		6.075 K1	8.55 K1	6.225 K1	5.675 K1	9.00 K1					
	Geneva, Utah		\$96.00 C7			5.275 C7	7.75 C7								
	Kansas City, Mo.					5.375 S2	7.85 S2							8.35 S2	
	Los Angeles, Torrance, Cal.		\$105.50 B2	\$134.00 B2		5.975 C7, B2	8.45 B2		5.675 C7, B2	9.05 J3, 9.28 C1				9.30 B2	17.25 J3
	Minneapolis, Colo.					5.575 C6			6.025 C6	9.10 K1					
	Portland, Ore.					6.825 D2									
	San Francisco, Niles, Pittsburgh, Cal.		\$105.50 B2			5.925 B2	8.40 B2		5.675 C7, B2						
	Seattle, Wash.		\$109.50 B2			6.825 R2	8.50 B2		5.925 B2						
SOUTH	Atlanta, Ga.					5.475 A8			4.925 A8						
	Fairfield, Ala., City, Birmingham, Ala.	\$77.50 T2	\$96.00 T2			5.275 T2, R1, C16	7.75 T2		4.925 T2, R3, C16		7.325 T2				
	Houston, Lone Star, Texas		\$101.00 S2	\$119.00 S2		5.375 S2	7.85 S2							8.35 S2	

(Effective May 23, 1958)

IRON AGE STEEL PRICES	Sheets								WIRE ROD	TINPLATE†		BLACK PLATE Holloware Enameling 29 ga.	
	Hot-rolled 1/8 in. & hvyr.	Cold- rolled	Galvanized	Enamel- ing	Long Teme	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box		
Bethlehem, Pa.													
Buffalo, N. Y.	4.925 B3	6.05 B3				7.275 B3	8.975 B3		6.15 W6	† Special coated mig. turno deduct 50¢ from 1.25-lb. coke base box price. Can-making blackplate 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb./0.25 lb. add 65¢.			
Claymont, Del.													
Coatesville, Pa.													
Conshohocken, Pa.	4.975 A2	6.10 A2				7.325 A2							
Harrisburg, Pa.													
Hartford, Conn.													
Johnstown, Pa.									6.15 B3				
Fairless, Pa.	4.975 U1	6.10 U1				7.325 U1	9.025 U1			\$10.15 U1	\$8.85 U1		
New Haven, Conn.													
Phoenixville, Pa.													
Sparrows Pt., Md.	4.925 B3	6.05 B3	6.00 B3			7.275 B3	8.975 B3	9.725 B3	6.25 B3	\$10.15 B3	\$8.85 B3		
Worcester, Mass.									6.45 A5				
Trenton, N. J.													
Alton, Ill.									6.35 L1				
Ashland, Ky.	4.925 A7		6.00 A7	6.625 A7									
Canton-Massillon, Dover, Ohio			6.00 R3, R1										
Chicago, Joliet, Ill.	4.925 W8, A1					7.275 U1			6.15 A5, R3, W8, N4, K2				
Sterling, Ill.									6.25 N4, K2				
Cleveland, Ohio	4.925 R3, J3	6.05 R3, J3		6.625 R3		7.275 R3, J3	8.975 R3, J3		6.15 A5				
Detroit, Mich.	5.025 G3, M2	6.15 G3 6.05 M2				7.375 G3	9.075 G3						
Newport, Ky.	4.925 A1	6.05 A1											
Gary, Ind. Harbor, Indiana	4.925 U1, J3, Y1	6.05 U1, J3, Y1	6.60 U1, J3	6.625 U1, J3, Y1	7.00 U1	7.275 U1, Y1, J3	8.975 U1, Y1		6.15 Y7	\$10.85 U1, Y1	\$8.75 J3, U1, Y1	7.50 U1, Y1	
Granite City, Ill.	5.125 G2	6.25 G2	6.80 G2	6.825 G2							\$8.85 G2	7.00 G2	
Kokomo, Ind.			6.70 C9						6.25 C9				
Mansfield, Ohio		6.05 E2			7.00 E2								
Middletown, Ohio		6.05 A7	6.60 A7	6.625 A7	7.00 A7								
Niles, Warren, Ohio Sharon, Pa.	4.925 R3, N3, S1	6.05 R3	6.60 R3	6.625 N3, S1, R3	7.00 N3, S1, R3	7.275 R3	8.975 S1, R3				\$8.75 R3		
Pittsburgh, Pa. Midland, Pa. Butler, Pa. Demora, Pa. Aliquippa, Pa.	4.925 U1, J3, P6	6.05 U1, J3	6.60 U1, J3	6.625 U1		7.275 U1, J3	8.975 U1, J3	9.725 U1	6.15 A5, J3, P6	\$10.85 U1, J3	\$8.75 U1, J3	7.50 U1, J3	
Portsmouth, Ohio	4.925 P7	6.05 P7							6.15 P7				
Weirton, Wheeling, Follansbee, W. Va.	4.925 W3, W5	6.05 W3, F3, W5	6.60 W3, W5		7.00 W3, W5	7.275 W3	8.975 W3			\$10.85 W3, W5	\$8.75 W3, W5	7.50 W3	
Youngstown, Ohio	4.925 U1, Y1	6.05 Y1		6.625 Y1		7.275 Y1	8.975 Y1		6.15 Y1				
Fontana Cal.	5.675 K1	7.30 K1				8.025 K1	10.275 K1			\$10.80 K1	\$8.50 K1		
Geneva, Utah	5.025 C7												
Kansas City, Mo.									6.40 S2				
Los Angeles, Torrance, Cal.									6.95 B2				
Minneapolis, Colo.									6.40 C6				
San Francisco, Niles, Pittsburgh, Cal.	5.625 C7	7.00 C7	7.35 C7						6.95 C7	\$10.80 C7	\$8.50 C7		
Seattle, Wash.													
Atlanta, Ga.													
Fairfield, Ala. Alabama City, Ala.	4.925 T2, R3	6.05 T2, R3	6.60 T2, R3	6.625 T2					6.15 T2, R3	\$10.15 T2	\$8.85 T2		
Houston, Tex.									6.40 S2				

(Effective May 28, 1958)

IRON AGE STEEL PRICES		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.									
		BARS					PLATES				WIRE
EAST	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
	Bethlehem, Pa.			6.475 B3	8.775 B3	7.925 B3					
	Buffalo, N. Y.	5.425 R3, B3	5.425 R3, B3	7.35 B5	6.475 B3, R3	8.775 B3, B5	7.925 B3	6.10 B3		7.20 B3	7.65 W6
	Claymont, Del.							5.10 C4		7.20 C4	7.625 C4
	Coatesville, Pa.							5.10 L4		7.20 L4	7.625 L4
	Conshohocken, Pa.							5.10 A2	6.175 A2	7.20 A2	7.625 A2
	Harrisburg, Pa.							5.10 P2	6.275 P2		
	Milton, Pa.	5.575 M7	5.575 M7								
	Hartford, Conn.			7.00 R3		8.875 R3	7.925 B3				
	Johnstown, Pa.	5.425 B3	5.425 B3		6.475 B3			5.10 B3		7.20 B3	7.625 B3
	Fairless, Pa.	5.575 U1	5.575 U1		6.825 U1						
	Newark, N. J.			7.75 W10 7.75 P10		8.95 W10 8.95 P10					
	Camden, N. J.										
	Bridgewater, Conn.			7.85 W10 7.85 J3	6.55 N8	8.925 N8					
	Putnam, Conn.										
	Willimantic, Conn.										
	Sparrows Pt., Md.		5.425 B3					5.10 B3		7.20 B3	7.75 B3
	Palmer, Worcester, Readville, Mass.			7.85 B5, C14		8.875 A5, B5					7.95 A5, W6
	Mansfield, Mass.										
	Spring City, Pa.			7.75 K4		8.85 K4					
	Alton, Ill.	5.625 L1									7.85 L1
	Ashland, Newport, Ky.							5.10 A7, A1		7.20 A1	
	Canonsburg, Massillon, Ohio	5.90* R3		7.30 R3, R2	6.475 R3, T3	8.775 R3, R2, T3					
	Chicago, Joliet, Waukegan, Ill.	5.425 U1, R3, W8, N4, P13	5.425 U1, R3, N4, P13	7.30 A5, W10, W8 B5, L2, N9	6.475 U1, R3, W8	8.775 A5, W10, W8 L2, N8, B5	7.925 U1, W8	5.10 U1, A1, W8, J3	6.175 U1	7.20 U1, W8	7.625 U1, W8
	Harvey, Ill.										7.65 A5, R3, W8, N4, K2, W7
	Cleveland, Ohio	5.425 R3	5.425 R3	7.30 A5, C13 C18		8.775 A5, C13, C18	7.925 R3	5.20 R3, J3	6.175 J3		7.65 A5, C13
	Elyria, Ohio										
	Detroit, Mich.	5.525 G3	5.775 G3	7.35 P3 7.50 P8, B5	6.475 R5 6.575 G3	8.775 R5 8.975 B5, P3, P8	8.825 G3	5.20 G3		7.35 G3	
	Duluth, Minn.										7.65 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 U1, J3, Y1	5.425 U1, J3, Y1	7.30 R3, J3	6.475 U1, J3, Y1	8.775 R3, M4	7.925 U1, Y1	5.10 U1, J3, Y1	6.175 J3, J3	7.20 U1, Y1	7.425 U1, Y1, J3
	Granite City, Ill.										7.75 M4
	Kokomo, Ind.			5.525 C9							
	Sterling, Ill.	5.525 N4	5.525 N4					5.10 N4			7.75 K2
	Niles, Warren, Ohio				7.30 C10	6.475 C10, S1	8.775 C10	7.925 S1	5.10 R3, S1		7.20 S1
	Sharon, Pa.										7.625 R3, S1
	Owensboro, Ky.				6.475 G5						
	Pittsburgh, Midland, Dunbar, Aliquippa, Pa.	5.425 U1, J3	5.425 U1, J3	7.30 A5, B4, R3, J3, C11, W10, S9, C8	6.475 U1, J3, C11, B7	8.775 A5, W10, R3, S9, C11, C8	7.925 U1, J3	5.10 U1, J3	6.175 U1	7.20 U1, J3, B7	7.625 U1, J3, B7
	Portsmouth, Ohio										7.65 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.10 W5			
	Youngstown, Ohio	5.425 U1, R3, Y1	5.425 U1, R3, Y1	7.30 A5, Y1, F2	6.475 U1, Y1	8.775 Y1, F2	7.925 U1, Y1	5.10 U1, R3, Y1		7.20 Y1	7.625 U1, R3, Y1
											7.65 Y1
	Emeryville, Cal. Fontana, Cal.	6.175 J5 6.125 K1	6.175 J5 6.125 K1		7.325 K1			6.425 K1		8.80 K1	8.425 K1
	Geneva, Utah							5.10 C7			7.625 C7
	Kansas City, Mo.	5.675 S2	5.675 S2		6.725 S2			8.175 S2			7.30 S2
	Los Angeles, Torrance, Cal.	6.125 C7, B2	6.125 C7, B2	8.75 R3, P14	7.325 B2	10.75 P14	8.625 B2				8.60 B2
	Minnequa, Colo.	5.875 C6	5.875 C6					5.95 C6			7.30 C6
	Portland, Ore.	6.175 O2	6.175 O2								
	San Francisco, Niles, Pittsburg, Cal.	6.125 C7 6.175 B2	6.125 C7 6.175 B2			8.675 B2					8.60 C7, C8
	Seattle, Wash.	6.175 B2, N6	6.175 B2			8.675 B2	6.80 B2		8.10 B2	8.525 B2	
	Atlanta, Ga.	5.625 A8	5.425 A8								7.65 A8
	Fairfield, Ala. City, Birmingham, Ala.	5.425 T2, R3, C16	5.425 T2, R3, C16	7.30 C16		7.925 T2	5.10 T2, R3			7.625 T2	7.65 T2, R3
	Houston, Ft. Worth, Lone Star, Tex.	5.675 S2	5.675 S2		8.725 S2		8.175 S2	5.20 S2 5.20 L3		7.30 S2	7.725 S2
											7.90 S2

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chapel Co., Cleveland
A7	Armc Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newport Steel Co., Newport, Ky.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calistrap Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C3	Central Iron & Steel Co., Harrisburg, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafing Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafing Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Div., Birmingham
C17	Chester Blast Furnace, Inc., Chester, Pa.
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Dearborn Div., Sharon Steel Corp.
D3	Drive Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire Steel Co., Mansfield, O.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.

G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owendale, Ky.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., Chicago
I3	Inland Steel Co., Chicago
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joalyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Cal.
K2	Keystone Steel & Wire Co., Peoria
K3	Koppers Co., Granite City, Ill.
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M6	Mystic Iron Works, Everett, Mass.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N3	Niles Rolling Mill Div., Niles, O.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Iron & Steel Co., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Scale & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
P17	Reeves Steel & Mfg. Co., Dover, O.
P18	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebling Sons Co., John A., Trenton, N. J.
R5	J. & L. Steel Co., Stainless Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S6	Standard Forging Corp., Chicago
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per cent) f.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS										
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.				
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	
Sparrows Pt. B3	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.0	12.75	+1.75	13.25	+1.25	14.75	+1.50
Youngstown R3	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50
Fairless M3	5.25	+23.5	+5.25	+19.5	+1.75	+15.00	9.75	+14.25	14.25	+0.75	14.75	+0.25	15.25	+0.50	16.75	+0.50	+9.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50	
Pittsburgh J3	5.25	+12.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Alton, Ill. L1	5.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.0	12.75	+1.75	13.25	+1.25	14.75	+1.50
Sharon M3	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Fairless N2	5.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.0	12.75	+1.75	13.25	+1.25	14.75	+1.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Pittsburgh N1	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Wheeling W5	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Wheatland W4	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Youngstown Y1	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+24.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Indiana Harbor Y1	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.75	+0.75	14.25	+0.25	15.75	+1.00	17.25	+20.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
Lorain N2	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	+0.25	15.25	+0.75	16.75	+0.50	18.25	+20.25	+2.75	+19.50	+0.25	+17.0	1.25	+15.50			
EXTRA STRONG PLAIN ENDS	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	
Sparrows Pt. B3	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	
Youngstown R3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Fairless N2	9.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	
Fentana K1	+3.75	0.25	3.25	3.75	4.25	4.75	5.25	
Pittsburgh J3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Alton, Ill. L1	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	
Sharon M3	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Pittsburgh N1	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Wheeling W5	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Wheatland W4	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Youngstown Y1	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Indiana Harbor Y1	8.75	+3.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			
Lorain N2	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50			

Threads only, butt-weld and seamless 2 1/2 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5% pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective May 23, 1958)

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh		
Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb, and over	10.5¢	
F.O.B. Riverton or Camden, New Jersey, west of Miss. River	9.5¢	
Domestic sponge iron, 98+% Fe, 23,000 lb, and over del'd East of Miss. River	10.5¢	
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢	
Canadian sponge iron, del'd in East, carloads	10.5¢	
Atomized iron powder, 98% + Fe, 40 mesh, F.O.B. Easton, Pa., in 100 lb bags	7.7¢	
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb bags. Freight allowed east of Miss. River	10.5¢	
Atomized iron powder, 98% + Fe, Cutting and scarfing grade, F.O.B. Easton, Pa.	8.5¢	
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢	
domestic 99.5+% Fe	36.5¢	
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢	
Electrolytic iron melting stock, 99.84% pure	27.0¢	
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe, .88.0¢ to \$2.85		
Alumina, freight allowed	38.00¢	
Brass, 10 ton lots	31.1¢ to 47.1¢	
Copper, electrolytic	41.50¢	
Copper, reduced	40.3¢ to 48.8¢	
Cadmium, 100-199 lb, 95% plus metal value		
Chromium, electrolytic, 99.85% min. Fe, 63 max. Del'd	\$5.00	
Lead, f.o.b. Hammond, Ind.	19¢	
Manganese f.o.b. Extron, Pa.	46.0¢	
Molybdenum, 99%	\$3.60 to \$3.95	
Nickel, chemically precipitated	\$1.05	
Nickel, unannealed	\$1.00	
Nickel, annealed	\$1.06	
Nickel, spherical, unannealed	\$1.13	
Silicon	43.50¢	
Solder powder	13¢ plus met. value	
Stainless steel, 302	\$1.02	
Stainless steel, 316	\$1.30	
Tin	14.0¢ plus metal value	
Tungsten, 99% (65 mesh) \$3.15 (nominal)		
Zinc, 5000 lb & over	17.5¢ to 30.7¢	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lbs.	40,000 Lbs.
3/8" and smaller x 6" and shorter	49	54	56	57
5/8" thru 1" x longer than 6"	55	40	43	45
Rolled thread carriage bolts 3/8" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44	47	48
Flow bolts, 3/8" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
5/8 in. or smaller	60 1/2¢
5/8 in. to 1 1/2 in. inclusive	55 1/2¢
1 1/2 in. to 1 1/2 in. inclusive	58 1/2¢
1 1/2 in. and larger	53 1/2¢

C. P. Hex, reg. & hvy.

5/8 in. and smaller	60 1/2¢
5/8 in. to 1 1/2 in. inclusive	55 1/2¢
1 1/2 in. and larger	53 1/2¢

Hot Galv. Hex Nuts (All Types)

5/8 in. and smaller	46 1/2¢
5/8 in. to 1 1/2 in. inclusive	55 1/2¢

Semi-finished Hex Nuts

5/8 in. and smaller	60 1/2¢
5/8 in. to 1 1/2 in. inclusive	55 1/2¢
1 1/2 in. and larger	53 1/2¢

(Add 25 pct for broken case or keg quantities)

Finished	5/8 in. and smaller	63
Rivets	Base per 100 lb	

5/8 in. and larger	\$12.25
7/16 in. and smaller	Pct. Off List 19

Cap Screws Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, pack-aged		
5/8" diam. and smaller x 6" and shorter	40	26
5/8" x 7/8" and 1" diam. x 6" and shorter	22	3
5/8" diam. and smaller x 6" and shorter than 6"	8	+18
5/8" x 7/8" and 1" diam. x 6" and shorter than 6"	6	+32

C-1018 Steel

Full-Finished

Cartons Bulk

1/4" through 5/8" dia. x 6" and shorter	58	49
5/8" through 1" dia. x 6" and shorter	45	33
Minimum quantity—1/4" through 5/8" dia., 15,000 pieces; 1/16" through 5/8" dia., 5,000 pieces; 5/8" through 1" dia., 2,000 pieces.		

Machine Screws & Stove Bolts

Discount

Plain Finish	Mach. Stove Bolts
Cartons	60

Bulk Quantity

To 1/4" diam.	25,000-and over	60	
Incl.			
5/16" to 1/4" diam.	15,000-200,000	60	
Incl.			

Machine Screws & Stove Bolt Nuts

Discount

In Cartons	Hex Square
	16 19

In Bulk	Quantity
5/8" diam. & smaller	25,000 and over

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	40.00
Electrodeposited	31.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.00
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.13 per lb (approx.)	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	68.70
Copper sulphate, 100 lb bags, per	22.15
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price \$4.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	48.00
N. Y.	
Chromic acid, flake type, 10,000 lb or more	31.00

CAST IRON WATER PIPE INDEX

Birmingham

125.8

New York

138.7

Chicago

140.9

San Francisco-L. A.

148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation, p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

Metropolitan Price, dollars per 100 lb.

City	Delivery Charge	Metropolitan Price, dollars per 100 lb.					
		Hot-Rolled (10 ga.)	Cold-Rolled (15 ga.)	Galvanized (10 ga.) [†]	Galvanized (10 ga.) ^{††}	Hot-Rolled (medium)	Cold-Finished
Atlanta	8.59	9.87	10.13	8.64	8.97	9.85	9.81
Baltimore	5.10	9.00	9.78	8.80	8.76	8.60	8.75
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.83
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.75
Cincinnati	.15	8.49	9.65	10.25	8.69	9.08	9.07
Cleveland	.15	8.33	9.60	10.35	8.48	8.94	8.96
Denver	.20	9.70	11.30	12.49	9.88	9.70	9.88
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.30
Houston	.10	7.10	8.05	—	7.25	8.05	7.20
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46
Los Angeles	.15	9.70 ^{**}	9.50	11.80	9.80	9.85	12.10 ^{**}
Memphis	.15	8.55	9.00	—	8.60	8.93	9.01
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45
Norfolk	.20	8.20	—	—	8.90	8.85	9.00
Philadelphia	.10	8.10	9.00	10.02	8.79	8.87	8.75
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.75
Portland	10.00 [†]	11.75 [†]	13.30 [†]	11.95 [†]	10.10 [†]	11.10 [†]	9.85 [†]
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60
Seattle	.10	9.95	11.15	12.20	10.00	9.70	10.10
Spokane	.15	10.10	11.30	12.15	10.15	9.85	10.25
St. Louis	.15	8.68	9.94	10.61	8.74	9.08	9.25
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ^{**}All sizes except 18 and 16 gauge.

[†]1104 zinc. ^{††}Deduct for country delivery. [†]C1018—1 in. rounds. ^{††}10 ga. x 36" x 120";

120 ga. x 36" x 120"; [†]26 ga. x 30" x 96"; ^{††}4 1/2" x 1" in lots of 1000 to 9999; [†]sheared plate 1/4" x 84" in lots of 1000 to 9999; ^{††}8" x 570" in lots of 1000 to 9999; [†]M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective May 23, 1958)

To identify producers, see Key on preceding page

TOOL STEEL

F.o.b. mill	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	\$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	2	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium	—	—	—	—	.925	D-3, D-5
Oil hardened manganese	—	—	—	—	.475	O-2
Special carbon	—	—	—	—	.36	W-1
Extra carbon	—	—	—	—	.36	W-1
Regular carbon	—	—	—	—	.305	W-1
Warehouse prices on and east of Mississippi are 4¢ lb higher. West of Mississippi, 6¢ higher.	—	—	—	—	—	—

CLAD STEEL

Stainless Type	Base prices, cents per lb f.o.b.			
	Plate (A3, J2, L4, C4)	Sheet (J2)	Cladding	10 pct
	15 pct	20 pct	20 pct	15 pct
302	—	—	—	37.50
304	37.95	42.25	46.70	46.00
316	44.40	49.50	54.50	56.75
321	40.65	44.60	49.30	47.25
347	42.40	47.55	52.60	57.00
405	29.85	33.35	36.85	—
410	29.55	33.10	36.70	—
430	29.80	33.55	37.25	—

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unfinished
Bessemer U1, Cleveland R3	5.525	6.50	6.975	—	—	—	14.75
So. Chicago R3	—	—	9.75	—	—	—	—
Endley T2	5.525	6.50	6.975	—	—	—	—
Fairfield T2	6.50	—	9.75	—	—	—	—
Gary U1	5.525	—	—	—	—	—	—
Huntington C16	6.50	—	—	—	—	—	—
Ind. Harbor B3	5.525	6.975	9.75	—	—	—	—
Ind. Harbor Y1	—	—	9.75	—	—	—	—
Johnstown B3	6.50	—	—	—	—	—	—
Joint U1	—	—	6.975	—	—	—	—
Kansas City S2	—	—	—	9.75	—	—	—
Lackawanna B3	5.525	6.50	6.975	—	—	—	14.75
Lebanon B3	—	—	6.975	—	14.50	—	—
Minnequa C6	5.525	7.00	6.975	9.75	—	—	—
Pittsburgh P5	—	—	—	—	—	—	—
Pittsburgh J3	—	—	—	9.75	—	—	—
Seattle B2	—	—	—	10.25	—	6.75	15.75
Struthers Y1	5.525	6.975	—	9.75	—	6.60	—
Terrace C7	—	—	—	—	—	6.75	—
Williamsport S5	—	6.50	—	9.75	—	—	—
Youngstown R3	—	—	—	9.75	—	—	—

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$15.00 to \$15.75
Foundry, beehive (f.o.b.)	\$17.50 to \$19.00
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Ia., f.o.b.	29.50
Palinesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Ia., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight charges for seller's account.	Gross Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage	Hot-Rolled (Cat Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi- Processed	Fully Processed
Field	—	—	9.625	—
Armature	11.10	10.85	11.35	—
Elect.	11.80	11.55	12.05	—
Special Motor	—	12.10	—	—
Motor	12.90	12.65	13.15	—
Dynamo	13.95	13.70	14.20	—
Trans. 72	15.00	14.75	15.25	—
Trans. 65	15.55	—	—	—
			Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20	—
Trans. 52	17.10	Trans. 80	19.20	—
		Trans. 73	19.70	—

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I5); Mansfield (E2); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

Diam. (In.)	Length (In.)	Price	GRAPHITE		CARBON*		
			Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)
24	84	26.00	40	100,110	10.70	—	—
20	72	25.25	35	110	10.70	—	—
18	72	25.75	30	110	10.85	—	—
14	72	25.75	24	72 to 84	11.25	—	—
12	72	26.25	20	90	11.00	—	—
10	60	28.00	17	72	11.40	—	—
10	48	28.50	14	72	11.85	—	—
7	60	28.25	12	60	12.95	—	—
6	60	31.50	10	60	13.00	—	—
4	40	35.00	8	60	13.30	—	—
3	40	37.00	—	—	—	—	—
2½	30	39.25	—	—	—	—	—
2	24	60.75	—	—	—	—	—

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa.
(except Salina, Pa., add \$0.00) \$135.00
No. 1 Ohio 130.00
Sec. Quality, Pa., Md., Ky., Mo., Ill. 130.00
No. 2 Ohio 103.00

Ground fire clay, net ton, bulk (except Salina, Pa., add \$2.00) 21.50

Silica Brick

Mt. Union, Pa., Endley, Ala. \$150.00
Childs, Hays, Pa. 155.00
Chicago District 160.00
Western Utah 175.00
California 180.00
Super Duty

Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 157.00-160.00

Silica cement, net ton, bulk, Latrobe 28.50

Silica cement, net ton, bulk, Chicago 25.50

Silica cement, net ton, bulk, Ensley, Ala. 26.50

Silica cement, net ton, bulk, Mt. Union 24.50

Silica cement, net ton, bulk, Utah 37.00

Silica cement, net ton, bulk, Calif. 37.00

Standard chemically bonded, Balt. 99.00

Standard chemically bonded, Curtin, Calif. 115.00

Burned, Balt. 99.00

Standard chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

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Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 131.00

Chemically bonded, Balt. 116.00

Standard chemically bonded, Balt. 13

PIG IRON

Dollars per gross ton, f.o.b.,
subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Boos.	Low Phos.
Birdsboro, Pa. <i>B6</i>	68.00	68.50	69.00	69.50	.....
Birmingham <i>R3</i>	62.00	62.50*	.....	.....	.....
Birmingham <i>W9</i>	62.00	62.50*	66.50	.....	.....
Birmingham <i>U4</i>	62.00	62.50*	66.50	.....	.....
Buffalo <i>R3</i>	66.00	66.50	67.00	67.50	.....
Buffalo <i>H1</i>	66.00	66.50	67.00	67.50	.....
Buffalo <i>W6</i>	66.00	66.50	67.00	67.50	.....
Chester <i>P2</i>	66.50	67.00	67.50	.....	.....
Chester <i>I4</i>	66.00	66.50	66.50	67.00	.....
Cleveland <i>A5</i>	66.00	66.50	66.50	67.00	71.00†
Cleveland <i>R3</i>	66.00	66.50	66.50	67.00	71.00†
Duuth <i>I4</i>	66.00	66.50	66.50	67.00	71.00†
Erie <i>I4</i>	65.00	66.50	66.50	67.00	71.00†
Everett <i>M6</i>	67.50	68.00	68.50	.....	.....
Fountain <i>K1</i>	75.00	75.50	.....	.....	.....
Geneva, Utah <i>C7</i>	66.00	66.50	.....	.....	.....
Granite City <i>G2</i>	67.90	68.40	68.90	.....	.....
Hubbard <i>Y1</i>	.....	.....	66.50	.....	.....
Ironon, Utah <i>C7</i>	66.00	66.50	.....	.....	.....
Midland <i>C11</i>	66.00	.....	.....	.....	.....
Minnequa <i>C6</i>	65.00	68.50	69.00	.....	.....
Monessen <i>P6</i>	66.00	.....	.....	.....	.....
Neville Is. <i>P4</i>	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda <i>T1</i>	66.50	67.00	67.50	68.00	.....
Sharpen <i>S1</i>	66.00	66.50	67.00	67.50	.....
St. Chicago <i>R5</i>	66.00	66.50	66.50	67.00	.....
St. Chicago <i>W8</i>	66.00	66.50	66.50	67.00	.....
Swedenland <i>A2</i>	66.00	66.50	66.50	67.00	59.50
Tulpe <i>P4</i>	66.00	66.50	66.50	67.00	59.50
Troy, N. Y. <i>R5</i>	66.00	66.50	66.50	67.00	59.50
Youngstown <i>Y1</i>	.....	66.50	69.00	69.50	74.00

DIFFERENTIALS: Add .75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) .5¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, .52 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo *(6 pct.)*, *H1*, \$79.25; Jackson *I1, I4* (Gage Disc), \$78.00; Niagara Falls *(15.01-15.50)*, \$161.00; Kodak *(14.01-14.50)*, \$163.50; *(15.51-16.00)*, \$166.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. **Remember** silvery pig iron (under .10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

* Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, re-roll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	64.75	37.75	33.75	34.25
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	69.75	40.25	35.00	36.75	36.00
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	79.25	48.25	40.25	—	40.75
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	52.50	61.50	35.75	32.00
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Red HR	40.00	46.75	42.00	42.75	45.50	45.25	69.25	52.50	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A5*; Massillon, O., *R5*; S. Chicago, *U7*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T3, R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owenboro, Ky., *G3*; Bridgeport, Conn., *N8*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structural: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., *S*; Chicago, *U1*; Owensboro, Ky., *G3*; Bridgeport, Conn., *N8*.

(Effective May 23, 1958)

MEET THE "Newest Baby" OF THE LEES-BRADNER LINE

This Dowding & Doll hobber is precision engineered and ruggedly built to turn out small meter, clock or instrument spur, helical and worm gears. Its extreme accuracy results in fine finished gears with perfect pitch and form. Simplicity and versatility are built into this machine.

Dowding & Doll hobbers are also available in models H7 (max. cap. 8 D. P.) and V8 (max. cap. 14 D. P.).

Write Lees-Bradner for full information on these small-sized, accurate hobbers.

SPECIFICATIONS • Model V4 (Illustrated)

Max. pitch in light metals and mild steel	20 D. P. (MOD 1/4)
Max. pitch in high tensile steel	25 D. P. (MOD 1)
Max. dia. for spur, helical or worm gears	4" (101mm.)
Max. hobbing width for spur gears—up to 2 3/4" dia. (70mm.)	3" (75mm.)
over 2 3/4" to 4" dia. (70—101mm.)	4" (101mm.)
Bore in work spindle	No. 3 M. T.
Hob Spindle Speeds	180, 250, 375, 510 r.p.m.



the **LEES-BRADNER** *Company*
CLEVELAND 11, OHIO • U.S.A.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.	67-71% Cr, .30-1.00% max. Si.
0.02% C	41.00
0.05% C	39.00
0.10% C	38.50
0.20% C	38.25
4.00-4.50% C	60-70% Cr, 1-2% Si, 28.75
3.50-5.00% C	57-64% Cr, 2.00-4.50% Si
0.025% C (Simplex)	27.50
0.10% C, 52-57% Cr, 2.00% max Si	36.75
7-8 1/2% max C, 50-55% Cr, 3-6% max Si	37.50
7-8 1/2% max C, 50-55% Cr, 3% max Si	22.50
Si	25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 37% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/8" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41% Si 42-45% C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

Cr	Si
Carloads, bulk	27.50
Ton lots	32.75
Less ton lots	34.35

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed. 16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	24.25
Ton lots	26.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	18.45
Ton lots	19.95

Graphidor No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	19.20
Ton lots to carload packed	21.15

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$100.50
19 to 21% 3% max.	102.50
21 to 23% 3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	35.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% (Bulk)	
P. 90% Mn	37.15 39.95 41.15
0.07% max. C	35.10 37.90 39.10
0.10% max. C	34.35 37.15 38.35
0.15% max. C	33.60 36.40 37.60
0.30% max. C	32.10 34.90 36.10
0.50% max. C	31.60 34.40 35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60 31.40 32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Packed, pallets, 3000 lb up to carloads	16.50

Silvery Iron (electric furnace)

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.	
Ton lots, Carloads packed	
96.75% Si, 1.25% Fe	24.20 22.90
98% Si, 0.75% Fe	24.95 23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	
50% Si	14.20
55% Si	17.5% Si
65% Si	15.25
90% Si	18.50

Calcium Metal

Eastern zone, cents per pound of metal, delivered.	
Cast	
Turnings	
Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
100 to 1999 lb	2.40 3.30 4.55

(Effective May 28, 1958)

Alisifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb

Carloads, bulk	10.35¢
Ton lots	11.70¢

Calcium molybdate, 43.6-46.6% f.o.b. Langlooth, Pa., per pound contained Mo

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cr

1.00
4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cr, 0.30% C, del'd ton lots, 2-in. x D per lb can't Sb plus Ta

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langlooth, Pa., per pound contained Mo

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

Ferrotungsten, 1/4 x down packed, per pounds contained W, ton lots delivered

Molyb

ZINC
STRIP AND WIRE
ZINC METALIZING WIRE
ZINC ACCURATELY ROLLED
for electric fuse elements

THE PLATT BROS. & CO., WATERBURY 20, CONN.

DYKEM
STEEL BLUE

Stops Losses
making Dies and
Templates



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With DYKEM Steel Blue
Without DYKEM Steel Blue

THE DYKEM COMPANY
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Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at the bench: metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

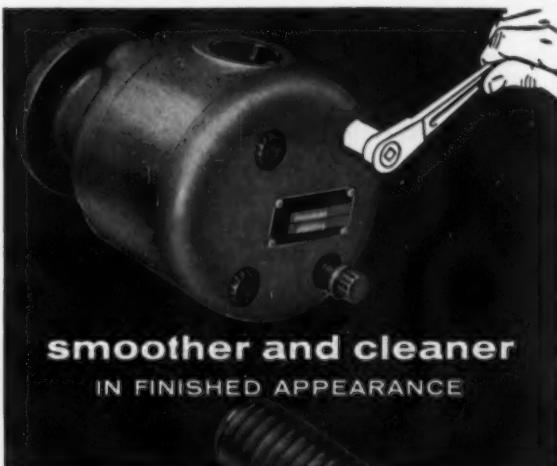
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END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, adheres closely. No grit; no residue to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

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The externally wrenchable screw
for socket head screw applications.

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NEW!
HIGH-SPEED
"Rapid-Blast"
MACLEOD
Blast Cleaning
Cabinet



The Brand New Type AL "Rapid-Blast" Cabinet is specifically designed for high rate of continuous automatic production. Also a complete line of rooms, machines and dust arresters. Over 60 years experience designing and building special equipment. Write for descriptive literature on MACLEOD Blast Cleaning Rooms, Cabinets, and Machines.



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Our widely diversified experience and ample manufacturing facilities; the ability to produce specification springs of consistent uniformity — are reasons why so many of the nation's leading manufacturers specify HAN-DEE.

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GUARANTEED**
ELECTRIC POWER EQUIPMENT
A.C. MOTORS
3 phase—60 cycle

SLIP RING					
Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-57988	6000	1800
1	1500	G.E.	MT	6000	1800
1	1100	F.M.	OVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	300	Cr. Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440/2300	720
1	250	G.E.	MT-124Y	3000	237
1	250	Cr. Wh.	Size 290	2300	350
1	250	A.C. Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	Cr. Wh.	20QB	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	1-17AM	2200	435
1	200	G.E.	IM	2300	580
1	150 (unused) Whse.	CW		2300	435
1	125	A.C.		440	865
1	125	A.C. Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695
SQUIRREL CAGE					
1	800	G.E.	FT-572	2200	1180
1	650	G.E.	FT-559H	440	3570
3	500	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1428	2300/4156	354
1	400	G.E.	IK	2200	500
1	300	Elliott	SC-BB DP	440	1770
1	300	G.E.	KT559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	IK-557	440	1000
1	150/75	G.E.	IK	440	900/150
1	150	Whse.	CS8568	440	880
1	150	Whse.	CS	440	580
SYNCHRONOUS					
Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	S5018L4000/6900/13800	514	
1	4000	G.E.	TS	4600/2300	360
1	2850	Whse.	Sn. f	2300/13800	514
1	2800	Whse.	Sn. f	2300	720
1	2000	Whse.	Sn. f	2300	102
2	1750	G.E.	ATI	2300	2600
1	735	G.E.	ATI	2200/12000	600
1	450	Whse.	2200	128.5	
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220/440	990

BELYEA COMPANY, Inc.
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RAILWAY EQUIPMENT

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Used-As Is-Reconditioned

RAILWAY CARS

All Types

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FREIGHT CAR REPAIR

Parts

For All Types of Cars

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Diesel, Steam, Gasoline

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SPECIAL

STANDARD GAUGE CARS

COVERED HOPPER CARS

10-70 ton Capacity

ORE HOPPER CARS

660 Cubic Feet

40- and 50-Ton Capacity

SIDE DUMP CARS

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"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

Buyers Are Reluctant In Detroit Area

**Used machinery dealers there
hunt customers both willing and
able to purchase.**

**Some plants postpone needed
equipment replacement until
business conditions improve.**

■ Used machinery dealers in Detroit are looking for customers with the desire to spend and the ability to pay.

Recent experiences show customers may be ready and willing to purchase tools and equipment, but are not able to do so. Others are able, but not willing. This has convinced dealers there are a number of modernization and replacement programs overhanging the market.

Full Speed Slowly—Dealers say they have worked out programs with plant master mechanics for updating equipment — programs complete on equipment, delivery schedules, installation, service arrangements, price, and terms. Then everything is knocked flat by an order to cancel the program or wait 60 to 90 days for a decision.

Because machinery dealers in the Detroit area are oriented to the automobile industry they are naturally looking for the automakers to supply the needed market boost.

No Green Lights—It's suggested automobile manufacturers and parts suppliers could do this by giving the go ahead to programs which have been approved as necessary, but pigeon-holed until the economic situation improves.

Dealers say many of these programs are considered necessary right now by manufacturing men

and others will be necessary within the next year or two. But management is reluctant to release the orders.

While these programs are doing little to help the present market, used machinery dealers take comfort in knowledge that positive improvement in the automobile business will be reflected in increased sales.

What Dealers Say—“We were among the first businesses to be affected by the downturn last year,” one dealer says. “We should be one of the first to start climbing out of the basement.”

Another dealer says sales have been so low “that any movement is an improvement — and we are seeing a small improvement, but there's no trend developing yet.”

One dealer explained that sales in the Detroit area are off 40 to 60 pct from last year due to the sharp decline of automobile production. However, he wasn't disheartened. “We've been through worse times than these. When the auto companies get going again, so will we—and at a good clip, too.”

Time Payments Slow—Plants are naturally reluctant to allocate money for expansion and improvements when earnings are reduced or in doubt. Some companies doing business with the automobile industry are also encountering difficulty making payments on time. “In some cases concerns which always paid on the 10th and 25th, now pay only on the 25th. Occasionally, payments are not approved by management until the following month,” a dealer reported.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL

3 x 3 x 1/2" Buffalo No. 1 Angle Bending Roll
Model #122-PX-40 Logemann, Baling Chamber 40
14 x 15"

BENDER & STRAIGHTENER

Pels Type JH All Steel Bender & Straightener for
Beams, Channels, Angles, Tees—Angles Equal &
Tees 5/8" x 1/4"

BENDING ROLLS

8" x 1/2" Bartsch Initial Type
12" x 5/16" Bartsch Initial Type
20" x 1/4" Niles Pyramid Type

BRAKES—PRESS TYPE

500 ton Pacific Hydraulic, 10' Bet. Housing
12" x 3/16" Cincinnati
10" x 1/2" & 12" x 1/4" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

1 ton P&H 50" Span 220/3/60
8 ton Shepard Niles 50" Span 220/3/60
7/2 ton Shaw 70" Span 220/3/60 D.C.
8 ton P&H 40" Span 230 Volt D.C.
10 ton P&H 55" Span 220/3/60
10 ton Shaw 30" Span 230 Volt D.C.
10 ton P&H 48" Span 230 Volt D.C.
10 ton Shaw 52" Span 230 Volt D.C.
10 ton Shaw 120" Span 230 Volt D.C.
15 ton Northern 54" Span 230 Volt D.C.
15 ton Shepard Niles 50" Span 230 Volt D.C.
20 ton Shepard Niles 98" Span 230 Volt D.C.
20 ton P&H 100" Span 230 Volt D.C.
10 ton Shepard Niles 77" Span 220/3/60

DRAW BENCH

10,000 lb. Atkin Stand Single Draw 44 Ft. Length

FLANGING MACHINE

1/2" McCabe Pneumatic Flanging Machine

FORGING MACHINES

1" to 5" Acme, Ajax, National
FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell
HARDWOOD BOARD DROP—STEAM DROP—STEAM
FORGING 300 lb. to 12,000 lb. Incl.

LEVELERS—ROLLER

27" Torrington, 19 Rolls 1.21/32" dia.
44" Newbold, 9 Rolls 4" dia.

60" Atkin Standard, 17 Rolls 4 1/2" dia.

MILLING MACHINE—PLANER TYPE

42" x 18" x 12" Ingersoll 2 Roll & 3 Side Heads

PRESSES—HYDRAULIC

500 ton HPM Fastraverse, Bed 26" x 34"
600 ton Elmes, 36" Stroke, 48x45" Bet. Cola.

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1	920	G.E.	.80	2300/440	3600
1	700	El. Mfry.	.80	440	360
1	450	Whse.	.80	2300	128
1	320	G.E.	.80	2300	3600
1	250	Whse.	.80	2300	720
1	200	G.E.	.80	2300/440	720
1	200	G.E.	.80	2300/440	600
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1	200	Al. Ch.	.80	2300/440	3600

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2	500	Al. Ch.	ARY	3200	500
1	500	G.E.	I-M	2300	450
1	400	Al. Ch.	ARY	3200	500
1	350	Whse.	CW	2300	1180
1	250	G.E.	5R	2300	1180
1	250	G.E.	MT-412	2300	450
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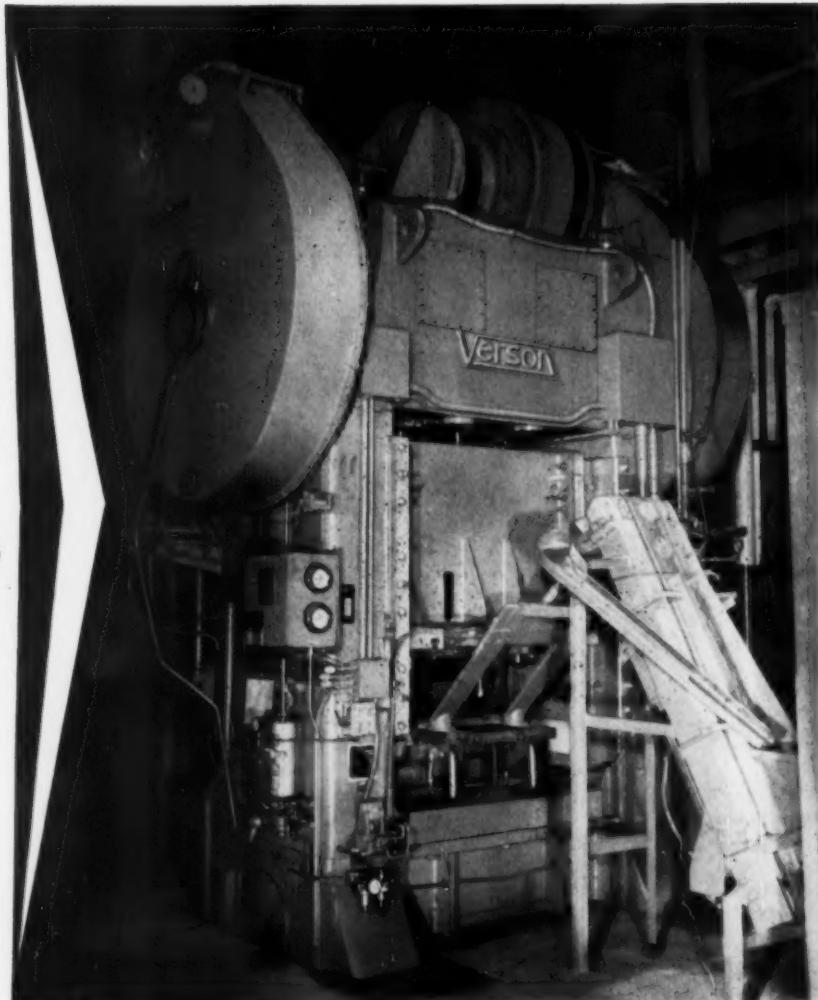
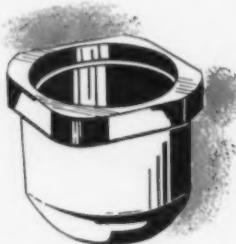


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